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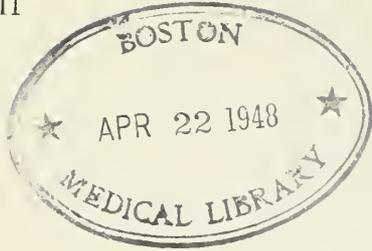
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A New Challenge—An Editorial

S. MARX WHITE, M.D.

EDITOR'S NOTE: Knowing that the entire medical profession is vitally interested in the recent report of the Committee on the Cost of Medical Care, the Journal-Lancet presents the following editorial. Our readers are urged to send their comments on this subject to us for publication.

THE recent publication of the report of the Committee on the Costs of Medical Care concluding its five years' study of some of the problems involved has been followed by a flood of comment in both professional and lay publications.

The report is not unanimous, nor could unanimity be expected for considerations reaching so deeply into human welfare. A brief analysis of the elements represented on the committee will help in understanding its value and in appraising the first-hand knowledge of the problems possessed by the various members.

The majority report is favored by 35 individuals, of whom 17 possess M. D. degrees. The groups represented in the majority are:

- (a) Private practice of Medicine—seven physicians.
- (b) Institutions and Special Interests—nine individuals of whom five have M. D. degrees.
- (c) Public Health—five members, four with M. D. degrees and one an internationally-known Dr. P. H.
- (d) Social Sciences—represented by five Ph. D.'s.
- (e) The Public—nine members, one of whom,

Dr. Ray Lyman Wilbur, physician, scientist and teacher, university president and Secretary of the Interior in President Hoover's Cabinet, was chairman.

A minority report is signed by eight physicians and one hospital association executive. This latter report is representative of opinion, editorial and otherwise, repeatedly expressed in the Journal of the American Medical Association desiring "to restore the general practitioner to the central place in medical practice." (The quotation is from recommendation IV in this minority report). A second minority report signed by two dentists agrees with the first minority in recommending the development of plans for medical care by state or county medical societies; in emphasizing the need for maintaining professional standards and the position of the general practitioner; and in declaring as Utopian and involving problems too visionary or too problematic to justify inclusion in such a report, the plan recommended by the majority, apparently its most fundamental specific proposal, for the development of suitable hospitals into comprehensive, non-profit "community medical centers."

A further recommendation of the majority re-

port is "that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both of these methods." (Quoted from recommendation III). This it seems to the writer is a recommendation for both voluntary insurance, and for state medicine by taxation. If this recommendation should encourage attempts at domination by political groups, or financing through intermediary agencies for profit, the objection to the plan made by the minority that it is economically wasteful, destructive to the high quality of medical care and unfairly exploits the medical profession is well taken.

The report is the product of many years of labor by outstanding and representative socially-minded physicians and laymen, and as such has been long awaited. In all probability it will be received by the public less critically than it deserves. Thoughtful study should be given by both professional and lay groups, and by the latter especially. The public welfare, involving as it must continued improvement in professional attainment and efficiency, is the paramount consideration. No plan or plans should be encouraged which look to the deterioration of the quality of the men entering the profession, or to lessening the incentives to high endeavor with full knowledge of the best that is known in medicine throughout the world. To preserve the quality of medical service requires that medical men continue to determine their own standards and methods without exploitation by other interests, and that no "muscling in" by intermediaries or for profit be tolerated. Development and growth in medicine has been on sound and enduring lines. That its economic application has lagged is clear, but this is not even a contributing cause of the bankruptcy in economic adaptation that business systems and the general public show today.

Many ways will need trial. Some are in successful operation. Time alone will tell whether the method now in operation in Iowa by which the management of co-operative effort is in the hands of the local medical society will prove the most effective, or whether our groupings must still be on a basis of self-management to be efficient. For us as a profession to hamper experiments planned to find the most effective methods would be to halt our own progress.

To the writer the encouragement given to medical men to group together for more effective service, fits in with the movement already developed better in this part of the country than elsewhere, and the opinion of the minority group that the establishment of private group clinics is in

line of progress when they are a natural outgrowth of local conditions, should help in the realization that in co-operative rather than in competitive individual practice lies, in all probability, one of the most effective checks to the menace of the ultimate participation of intermediaries for profit, or of the state in the practice of the healing art.

An immediate incentive to this editorial contribution lies in certain responses the report has already aroused in Minneapolis, St. Paul and Duluth. The dailies in these cities have carried news of plans by hospitals whereby persons may be assured of a certain amount of hospitalization annually by regular prepayment of a small sum per month. A statement by the chairman of a special committee of the Hospital Council of Minneapolis shows that they believe that they must work out some co-operative arrangement by which persons of moderate means may continue to maintain themselves in the matter of hospitalization on the basis of self-respect and self-reliance. The plans under consideration by the Hospital Council do not contemplate profits but are intended to provide costs of service and might arrange for setting up a corporation not for profit among participating hospitals and the selling by it of service to wage or salary earners within professional or industrial groups. It is stated that the number of individuals served would need to be large enough to make the law of averages apply safely; e. g., 5,000 or more, and that on the other hand a larger number should not be taken than can be safely handled. The prepaid monthly fees suggested as needed to provide say three weeks hospitalization per year range from 75 cents to \$1.00. The plan does not contemplate professional service by the physician. Patients would have full choice of hospital and of physicians treating them in the hospital, providing the physician selected is in good standing in the medical profession. His compensation would be separate and paid to him on the same basis as at present. It is stated that the plan, before it could be put in operation, would require the approval of the recognized medical bodies and of the boards of the several hospitals.

Such plans for group hospitalization run by hospital associations have already been in operation for two years in other cities. As a contrast we hear of the National Hospitalization Service, Inc., of Dallas, Texas, run by lay people, with one-third of the fees going to the promoters! The public needs, as never before, to be on its guard against the racketeer in both hospitalization and medical service. Medical men have a solemn

obligation to meet the public need by such adjustments that professional qualifications are not sacrificed, and that professional attainments continue to be still further enhanced. At the same time all who wish to be independent and pay as they go should be aided in their attempts to secure adequate medical and hospital service within their means.

The doctor needs to exercise care that medical and not hospital service is primary. The doctor is not an appendage of the hospital, nor is the hospital a place to go unless such care is needed in the proper management of the case. Determination of the need of hospital care is for the physician. It should be a part of his more effective service when circumstances require it. To provide plans for prepayment of hospital service without corresponding inclusion of the full medical service managed by an organization controlled by physicians would invite domination by hospital instead of by medical interests. To provide a form of medical as well as hospital insurance against all the costs of illness, but without cash

benefits is a procedure more economically sound than accident and disability insurance or workmen's compensation with their cash benefits, or than so-called life insurance with its benefits payable only after death. For the same reasons that many life insurance companies are leading today in certain movements for better health, so this form of set-up would inevitably lend an impetus toward prevention of illness and disability. The need for this impetus has been stressed in the committee report first referred to. The ideals of our profession since the days of Pasteur and Koch have given preventive medicine precedence over cure. Having entered this path we may not now turn back.

It is evident that the report of the Committee on the Costs of Medical Care brings with it a challenge which must be met not tomorrow, but now, or others will be ahead of us. It has already been proved that no profession has a larger proportion of men willing and able to meet effectively this new responsibility and opportunity.

Sinus Infections in Children*

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THE writer has been of the opinion for some time that sinus infections in children has been given but slight attention, if any at all, by many physicians in this country, resulting therefore in the inferior development and lowered resistance of the individual. It is proposed in this paper, therefore, to merely present the subject in so far as it affects the general practitioner, rather than submit a highly specialized discussion as would be proper in a journal devoted exclusively to rhinology. Viewing this subject in this light, two important points should be stressed, namely, diagnosis and treatment.

But why should these unfortunate little victims of this wide-spread disease be allowed to drift along in this condition? It is entirely unnecessary for if it is recognized early by the family doctor, or at least suspicion cast in its direction and the patients referred to a competent rhinologist for treatment, there will result a much less percentage of sub-acute and chronic cases than we now have. In case the patient lives in a community far removed from a specialist, or if conditions are such as to prevent frequent visits to him, then there

are a few simple diagnostic signs as well as simple medical procedures which can be resorted to by the general practitioner much to the benefit of the child's future health as well as his present condition. In other words, this paper is a plea for early recognition and eradication if possible of sinusitis in the young, which experience proves can be acquired, thereby resulting in a healthier and more robust outlook for the future welfare of the nation. It is an economic question as well as a medical one because chronic sinusitis results not only in the local suffering it causes, but also in its remote effect upon the entire organism. The effect of this is not difficult to see because by the time the child reaches maturity his economic value to society is greatly hampered by his defective physical makeup.

ETIOLOGICAL FACTORS

We as clinicians know beyond a doubt that any condition interfering with the free ventilation and drainage of the nasal fossae acts as a predisposing factor in sinus infections. Such conditions most often encountered are (1) a hypertrophic nasal and pharyngeal mucosa resulting from infected tonsils and adenoids, (2) pale boggy mucosa asso-

*From the Red River Valley Clinic, Grand Forks, N. D. Read by invitation before the Watertown District Medical Society, Watertown, S. D., Aug. 9, 1932.

ciated with allergic conditions, (3) enlarged or abnormally formed turbinates, (4) septal deviations, (5) ridges or nasal spurs, and (6) traumatic deformities of the nose.

Lowered resistance from unbalanced or vitamin deficient diets is being more recognized at this time among general predisposing causes.

Acute colds, tonsillitis, and the acute exanthemata such as (1) measles, (2) scarlet fever, and also whooping cough, frequently are complicated by infected sinuses. Other factors which are important are poor climatic conditions in which there are sudden changes in temperature and excessive dampness. This seems to be especially true in this northwest country where sinus infection is very prevalent. The use of the public swimming pool where hundreds of children are subjected daily to infection in the summer months is a great factor not only in sinusitis but also in mastoiditis and otitic fungus infections and should, in the writer's opinion, be prohibited by law. There are of course many more factors having a great bearing on the frequency of sinusitis but space and time prohibits their mention. The above list will, for all practical purposes, serve as a good working basis.

SYMPTOMATOLOGY

Symptoms of infection of the nasal accessory sinuses in children, by one or several of the following, may very accurately be accepted: (1) profuse nasal or post-nasal discharge, (2) cough, (3) persistent mouth-breathing following tonsillectomy and the complete removal of adenoids, (4) pallor of face and lips, (5) discharging ear, (6) otitis externa, (7) mastoiditis (Lemere¹ found in routine X-raying of the sinuses marked opacity of the antra in a large number of cases), (8) poor appetite, (9) recurring bronchitis, (10) pneumonia and asthma, (11) head-aches, (12) mental depression, (13) chorea and nervousness, (14) chronic pharyngitis, (15) arthritis, and (16) facial acne.

ANATOMICAL CONSIDERATIONS

A brief survey of the anatomy of the sinuses in children, the writer believes, would be quite apropos at this time. According to the measurements of Schaeffer² and others in a large series of cases, it is found that at birth the antrum is clearly the largest cavity, and this relative size is retained in regard to the other nasal accessory sinuses. In the experience of Lemere as well as the author, the seat of infection has been found much more frequently in the antrum than elsewhere. It is, therefore, not difficult to see why infection in the antrum is so frequent.

According to Davis³ and others, in average cases, the sinuses have assumed approximately their adult type of outlines by the fourteenth year though their ultimate maximum dimensions have not as yet been reached. For all practical and clinical purposes, then, let us consider that childhood has terminated at the close of the thirteenth year.

DIAGNOSIS

(1) *The Discharge*—In all cases in which there is profuse purulent or muco-purulent discharge from the nose, this discharge will be accounted for by the sinus infection present. In case the history and inspection of the nasal fossae and posterior pharynx do not give any definite evidence of discharge, the simple use of the post-nasal spray, which will be discussed more fully later, will if any thick secretion be present, expel large quantities from the nose and throat. At other times when the child is under ether anaesthesia for tonsillectomy and adenoidectomy, if there be present excessive sinus secretions, they will be evident by profuse discharge into the pharynx. The author has witnessed this condition in numerous tonsillectomies he has performed and has so advised the parents the proper future course to follow. According to Lemere¹, a long standing antrum infection with bone involvement can be usually recognized by atrophic changes in the nasal mucosa combined with a glazed sticky scant secretion..

(2) *Signs of General Toxemia*—When such signs are present infection in the nasal sinuses should be sought for with the greatest care, and attention directed to them as being of the greatest significance in the source of the toxemia.

(3) *The Roentgenogram*—In antrum infections, especially, the roentgen ray furnishes great diagnostic aid but one rarely sees a dense shadow in children. However, a slight density greater than the normal may be accepted as having a decided diagnostic value. But this useful aid will not be available to many physicians in the country due to their lack of X-Ray equipment. It should be said here that the proper technique in sinus films is an art requiring the proper position of the plate and ray in relation to the special cavity to be exposed, and for a certain definite period of time, if we are to derive any benefit from the roentgenogram. This can only be accomplished by accuracy and special training and therefore the roentgenologist should be consulted in the great majority of cases. In other words, unless one has had special training in taking sinus films the results are disappointing and misleading. As to the interpreta-

tion of the films, it is the opinion of the writer that the best results are had by the careful study of them by the roentgenologist together with the rhinologist. The films are also useful besides their diagnostic value (1) by showing the anatomical outlines, thereby giving us an idea of the size of the cavities should operation be found necessary, and (2) by showing the progress being made as the result of treatment. This is the ideal method of procedure but in these times of reduced incomes, the majority of patients are unable to avail themselves of this service so that more stress must be placed on the clinical findings in each individual case.

(4) *External Evidence*—This may be present, such as a broadening of the bridge of the nose and a skin eruption on the bridge. This, however, is not always evident.

(5) *The Pharynx* posterior to the tonsils is very often found to be greatly inflamed or covered with mucous, or else the mucosa is greatly thickened and numerous enlarged lymph follicles are seen upon it.

TREATMENT

The writer, in the beginning of this discussion, mentioned that chronic sinusitis is an economic question. He desires now to emphasize the fact that acute conditions have an economic aspect also, as regards the procedure in their treatment. In other words, we must arrive at a satisfactory method of therapy which should be simple and conservative and not requiring prolonged hospitalization which is quite unnecessary. The simple method to be proposed, experience has proved to be absolutely reliable, and has not only greatly improved all patients in the different stages of their pathology but has caused all symptoms to have absolutely disappeared in those who have undergone it in the early stages of the disease. The writer has had occasion to watch results of this method for a number of years in the hands of Henry B. Lemere, formerly of Omaha, Nebr., but now of Los Angeles, and also his own father, the late John Monro Banister, of Omaha, and has in his own practice noted excellent results from its use. The usual method of spraying the nose by inserting the nasal tip into the anterior nares is of little if any value. This is evident for several reasons; in the first place it is impossible to command enough force to propel the stream to the proper area by the usual blub syringes, and secondly, if it were done with the necessary force to clear the nasal fossae and pharynx, considerable trauma and

bleeding would result thereby defeating its purpose and doing more harm than good.

As to the proper washing of the pharynx, nasopharynx, and nasal fossae, the following procedure is enthusiastically recommended; namely, the post-nasal spray with compressed air using a soothing antiseptic alkaline solution. With the post-nasal spray the only possible bleeding is from the naso-pharynx, and this is only when adenoids or granulation tissue are present, and even then it is negligible. This bleeding, if it occurs, rarely happens after the first two or three applications and is of some benefit even then in relieving the congestion of the nasopharynx. The author would like to see one case where anterior syringing can expel this tenacious secretion. Although this discussion is in the interest of children, all adult patients, it might be mentioned, receive the same routine treatment in his office with the same beneficial results.

Before using the post-nasal spray, an attempt should be made to shrink the nasal mucosa and boggy turbinates with an efficient vaso-constrictor solution. Due to the inability to directly apply cotton pledgets soaked in the solution to the middle meatus, especially in very young children, one must resort to dropping the shrinking solution into each nostril care being taken that the drops reach the desired middle turbinate region. This is accomplished by placing the child on his back on a bed or table, or else across the knees and allowing the head to extend well backwards over the edge of the bed or lap till the chin is in a vertical plane with the ears. Only in this position will the drops reach the desired region. In older children, who still won't allow direct application, the use of a shrinking medium in a water soluble base, as the numerous Ephedrine jellies, which they can draw up each nostril works fairly well. However, the direct application under direct vision when it can be done is the ideal method and the one of choice.

The post-nasal spray may be challenged by some not familiar with its use as predisposing to middle ear infection by the washing of infected material into the middle ear by way of the Eustachian tubes. Experience has not shown one case in which this accident has occurred, and the number of cases treated this way would reach into the hundreds in the author's knowledge. The question arises as to the frequency of the post-nasal spray. It should be applied as often as is necessary to keep the head clear and to retard general symptoms. It is necessary daily in some cases while in others, once or twice a week will suffice. The average should be every

alternate day for a month and then less frequently. It so happens that these children cannot be brought to the office as often as is necessary, and so some means must be found whereby this treatment can be carried out in the home. In a great many cases this is the proper solution, as the neglect of these cases merely results in great harm and untold consequences. An inexpensive apparatus is provided for the parents and they are instructed in its use. These mild antrum cases requiring treatment are so numerous that, if the children are to reach their proper development, the rhinologist would be swamped. In other words, since the specialist can not personally treat all these mild cases but must devote his attention primarily to the more advanced ones requiring the skilled and special knowledge of his field, he can suggest methods for their relief to the family physician who can carry out the simple medical measures previously laid down. The parent as well as his doctor has only to witness the great beneficial results from a few weeks or months use of this therapy in order to be willing to continue it themselves at home.

The patient's confidence must first be gained in order to abolish the fear in the minds of these little ones. This is quite readily done if the procedure be demonstrated to the child upon his parents so that he will realize that there is no pain connected with it. If he is treated tactfully and his reason appealed to, after two or three applications of the spray, he will in the great majority of cases yield willingly to it; but if force is resorted to, failure will usually result. A little patience in the beginning, even though it takes a little more of the operator's time, will be rewarded in the end.

This treatment can be used in patients as young as three years of age. Lemere¹ believes that in children under eight years, the infection is eliminated entirely, while in those over this age it is greatly checked till the patient is sufficiently mature to permit of an opening being made into the antrum via the inferior meatus by operative means. Of course it goes without saying that any case requiring operative intervention should be referred to a competent rhinologist, so that operative procedures and technique have no place in this paper. However, it should be mentioned that an operation does not affect a cure per se as is so often believed and expected by the general public as well as some physicians. It merely renders the antrum accessible to treatment which is accomplished by frequent washings and instillations of mild antiseptic solutions

as well as making proper drainage and ventilation possible. The post-operative treatment should be carried out for several months and the individual kept under observation for at least a year if possible.

Another important medical measure must be touched upon to make this program complete, namely, suction. Suction not only drains the infectious secretions from the sinuses but also produces a "Bier's hyperemia" of the lining membrane which is of great value in restoring the membrane to a healthy condition. The use of suction is obtained by attaching to any negative pressure apparatus, such as a water pump attached to the hydrant, any cone-shaped hollow tip which when applied to the nostril closes it. The regular nasal tips are excellent but are not necessary, as an ordinary tip of a medicine dropper perforated serves the purpose admirably. These tips may be attached to any ordinary soft rubber suction bulb and produce fairly good suction for the rural patient.

During the fever stage, the patient is kept in bed and supportive treatment given. Vaccines, autogenous or stock, may be tried though their value has not been definitely determined. Good air and sunshine are necessary in all types of sinusitis in children as well as Cod Liver oil, especially in the winter months. Change of climate is sometimes advantageous in some cases.

Just a brief mention of chronic sinusitis should be in order at this time. Lack of complete resolution of an acute sinus involvement result in a chronic infection which, when once it has gained a foothold, is the beginning of many years of discomfort and a miserable existence. If proper prophylaxis were given the proper attention in childhood, a large percentage of these chronic cases would be eradicated. In the writer's daily practice, he sees many patients past middle age and well up in the sixties showing all the signs and symptoms of a chronic involvement as well as a catarrh of the Eustachian tubes, thereby, resulting in marked conduction deafness with extreme head noises and ringing in the ears. These patients in this advanced condition expect to be cured. A careful history usually reveals that they have always had "catarrh" and in childhood had the usual contagious diseases relative to that period. Their treatment should have been begun in their youth.

The acute exanthemata, as measles, scarlet fever, etc., leave in their wake retained purulent infection in the nose and sinuses to which absolutely no attention is usually given, the resolution of the primary disease being the only concern of

the average medical man. As a result, this infection, which could easily be washed out a few times with the post-nasal spray, would disappear thereby saving these poor children from the ravages of future suffering and poor health. Let us strive, therefore, to pay a little attention to nasal cleanliness during these epidemics before we can safely dismiss the child as cured. A moderate number of these chronic cases clear up to some extent by the removal of tonsils and adenoids. The adenoids act as a mechanical blockage to nasal breathing resulting in retention of the infected nasal secretions which appears very logical if one is familiar with the physiology of the upper air passages. However, the writer

would advise the post-nasal spray as a follow-up method even after such surgical procedure.

The following quotation by Coffin⁴ sums up this subject admirably; he says, "As sinus disease in children becomes better known and its seriousness more frequently recognized by the general practitioner and pediatrician, greater prophylactic measures will be instituted to the end, let us hope, that the occurrence of this serious malady may be ever on the wane."

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A Consideration of Some Factors in Early Hypertension

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ESSENTIAL hypertension and its consequence give rise to many clinical signs and pathological complications. Every organ in the body bears in some measure the burden of a persistent increased blood pressure. Much data have been accumulated on the consequences of hypertension, on the structural changes and the end results induced by it on the various organs of the body; but very little work has been done on the study of the early bodily changes in hypertension, their extent and the rate at which they are progressing.

The present study was undertaken with this purpose in mind. The material consisted of a group of ex-service men examined at the heart clinic of the Veterans' Administration, Minneapolis. All of the men were in the fourth or fifth decade of life, the average age being 39.7 years. That this is the period at which hypertension develops in a large proportion of the people is believed by most observers. Fishberg in a study of 96 cases of all ages found only six cases under 40 years of age. Eighty per cent of the cases occurred after forty. Diehl and Sutherland at the University of Minnesota found only 4.4 per cent of the male students with a blood pressure of 140 or over, and very few with a blood pressure of 160.

A persistent systolic pressure of 150 or over was taken as the lower limit of hypertension, and only those cases were considered in which the hypertension was the primary condition, and in

which such other causes of hypertension as glomerulonephritis, urinary obstruction, hyperthyroidism, aortic insufficiency, tumors of the adrenal cortex, and increased intracranial pressure could be excluded. Ninety-eight cases are included in the present study and while this is a very small group from which to draw definite conclusions, yet certain trends are to be noted which tend to throw some light on the progressive clinical pathology of essential hypertension. It is hoped to continue this study on a larger series of cases and on various phases of hypertension and its manifestations.

DURATION

The known duration of the hypertension varied from a few months to 10 years, the average for the entire group being two years. The majority of cases were discovered on routine examination, as seen in Table I.

TABLE I
Average Known Duration of Hypertension and Percentages Discovered by Routine Examination at the Various Blood Pressures

	150	160	170	180	190	210	220	230	240	250	Total (av.)
Number cases...	9	29	21	14	6	4	5	2	6	2	98
Average duration (years)	2	2	2	3	1.3	1	2	2	4	1	2
Discovered on routine examination (per cent)	100	80	70	63	85	25	40	50	50	50	70

Seventy per cent of the total number were found in this manner. All the cases with a systolic pressure of 150 mms. were found in this way,

while 50 per cent of those within systolic pressure of 250 mms. were so discovered.

CHIEF COMPLAINT

While the above findings corroborate the knowledge that a moderate and even a severe hypertension may exist for some time without any definite symptoms, or at least without complaints of such a nature as would necessitate the seeking of medical advice, yet a careful and thorough history taken in each case reveals certain complaints which are common to a large number of the group.

TABLE II
Chief Complaint in Relation to Blood Pressure

Blood Pressure...	150	160	170	180	190	210	220	230	240	Total (av.)
Number of Cases...	9	29	21	14	6	4	5	2	6	96
Headache, per cent...	22	14	24	7	17	25	20	50	17	20
Palpitation, per cent	11	18	5	14	17	0	0	0	0	10
Dyspnea, per cent...	11	15	19	29	0	25	20	0	50	17
Dizziness, per cent...	0	7	9	29	0	0	0	0	33	8
Pain, per cent.....	0	15	0	0	0	25	20	0	0	5
None, per cent.....	56	31	43	14	66	0	40	0	0	32

Table II shows the percentages of the chief symptoms complained of in each group, arranged according to the height of the blood pressure. Headache was the most frequent symptom complained of, being present in 20 per cent of the entire group. The frequency of the complaint does not seem to vary greatly with the increase of blood pressure. Dyspnea is the next most common complaint and was present in 17 per cent of the cases. The frequency of this symptom increased with the increase of the blood pressure. Palpitation was the chief complaint in 10 per cent of the cases and was noted only in the cases with systolic pressures of 190 or less, and not in the cases with systolic pressure 200 or over. Dizziness was a variable symptom, being complained of by only 8 per cent of the entire group. Pain in the precordium was noted in only 5 per cent of the cases.

SYMPTOMATOLOGY

The symptoms of hypertension of long standing are those of the three major syndromes which develop, namely, the cardiac, the cerebral, and the renal. One type or the other predominates, and usually symptoms related to all three types exist together.

O'Hare, Ohler, and others believe that there is a prehypertensive state in youth, manifested by signs of vasomotor disturbances such as dizziness, palpitations, nervousness, irritability, and cold cyanotic hands, which may be the basis for the development of a permanent hypertension. However, it is not proven that hypertension is more prevalent in this nervous type of individual than in the phlegmatic type.

In this group of cases of early hypertension we find the symptoms developing in close relation with the development of pathology in the various organs. In the groups with a blood pressure of 170 millimeters of mercury or over, symptoms referable to the heart, brain, and kidneys are complained of with great frequency.

Autointoxication has been given as an etiologic factor in the development of hypertension. However, no correlation was found between constipation and hypertension in this series. Only 15 per cent of patients in this group complained of constipation.

OBESITY

The close association of obesity and hypertension has led many to believe that there may be a definite relationship between these conditions. The frequent lowering of blood pressure by reduction of weight only tends to enhance this belief. Gager and Hurlin analyzed a series of 3,397 patients and found higher blood pressures in the various age groups as weight increased. Several other investigations have been carried out which show the frequent association of obesity and increased blood pressure. There is no convincing evidence, however, that obesity is an etiological factor in hypertension. It is known that many obese persons have a low blood pressure. It is more likely that both hypertension and obesity are expressions of some underlying disturbance of metabolism and that both may be inherited characteristics. In the present series it was found that 30 per cent were of normal average weight, 28 per cent were underweight, and 42 per cent were overweight. The majority were therefore, of average weight or underweight. To determine further whether obesity was an etiological factor, an inquiry was made as to a gain or loss of weight in the last 10 years. It was found that only 9 per cent of the group had gained weight in the last 10 years, while 30 per cent had lost weight and 61 per cent had remained stationary.

TABLE III
An Analysis of Weight in Relation to Blood Pressure

Blood pressure...	150	160	170	180	190	210	220	230	240	250	Total
Number of cases	9	29	21	14	6	4	5	2	6	2	98
Average weight, per cent.....	22	38	24	21	17	0	0	50	20	0	30
Underweight, per cent.....	45	14	33	29	17	75	0	50	80	50	28
Overweight, per cent.....	33	48	43	50	66	25	100	0	0	50	42
Gain last 10 years, per cent	11	15	0	14	0	25	20	0	..	..	9
Lost last 10 years, per cent	43	33	33	22	17	50	20	0	50	..	30
Stationary, last 10 years, per cent.....	44	52	67	64	83	..	60	100	50	..	61

DIET

The effect of high and low protein diets on

blood pressure has been extensively studied and no related changes in blood pressure were found. In this group a high protein diet was not found to bear any relationship to the hypertension. Twenty-five per cent of the group stated that they had always been heavy meat eaters. It is likely that the same percentage of heavy meat eaters would be found in a nonhypertensive group.

It is generally believed that retention of chlorides is not an etiological factor in hypertension, although Allen and Sherrill have succeeded in lowering blood pressure in a large group of hypertension cases by a salt-free diet. Other observers have found no effects on hypertension as a result of varying the salt intake. In this series 32 per cent of the patients stated that they used more salt on their food than the average person. Alcohol, tobacco, and coffee were not found to be of any etiological importance in this group.

CLINICAL PATHOLOGY

In hypertension of long standing we recognize the condition by the clinical signs in the heart, brain, or kidneys. In the heart we find evidence of enlargement, myocardial insufficiency, decompensation, or coronary disease. In the brain we find evidence of hemorrhage or softening due to cerebral arteriosclerosis. In the kidneys we find evidence of renal insufficiency. To determine how soon clinical signs of involvement of these organs can be detected in early hypertension has been the chief purpose of this study. The results are shown in Table IV.

TABLE IV
Clinical Pathology in Relation to Blood Pressure

Blood pressure....	150	160	170	180	190	210	220	230	240	250
Number of cases....	9	29	21	14	6	4	5	2	6	2
Average vital capacity	86	87.5	82.5	75	86	87	82.5	88	73	79.5
Eye grounds, per cent	0	3.3	37	23	40	25	100	100	100	100
Average cardio-thoracic ratio (X-ray), per cent....	43	44	44	47	49	50	47	53	52	49
EKG, per cent	0	7	24	50	17	59	100	50	100	100

VITAL CAPACITY

Determination of the vital capacity of the lungs was used as a test for cardiac efficiency. No definite relationship could be found between the height of the blood pressure and the vital capacity. The majority of these cases were well compensated, and this may account for the relatively high vital capacity in all of this group.

SIZE OF THE HEART

The size of the heart was determined by means of roentgen-ray measurements, taken from 6-foot plates of the heart. The cardiothoracic ratio was used as the index of enlargement. A gra-

dual increase in the cardiothoracic ratio is noted with the increase of blood pressure. In the groups with a blood pressure of 190 or over, definite cardiac enlargement is found. The beginning of hypertrophy, however, can not be determined, for it is known that early hypertrophy can not be detected by X-ray. Bell and Clawson, in their study of 420 cases of hypertension at autopsy, found the weight of the heart increased in 70 per cent of 220 cases with known hypertension, and below the limit of normal in 30 per cent.

ELECTROCARDIOGRAPHIC SIGNS

Changes in the electrocardiogram offer definite evidence of involvement of the myocardium in hypertension. Changes in conduction, evidence of ventricular preponderance and changes in the Q-RS and T waves are the predominant signs found in these cases. Abnormal electrocardiographic signs are not found with and frequency until we reach the group with a systolic pressure of 170. Here we find 24 per cent showing abnormal signs. Evidence of arborization block is the most frequent sign noted in this group. With the increase of blood pressure, negative T waves, depression and elevation of the S-T phase occur also with increasing frequency. These findings indicate that the heart is involved quite early in this group of patients. Bell and Clawson, in their study of necropsy material of hypertension, found only 10 per cent of the cases without notable signs of coronary disease. Fifty-five per cent showed coronary disease of a moderate degree, and 35 per cent of a severe degree. In the cases under 50 years of age they found that 25 out of 27 showed some coronary disease. A comparison, therefore, of the electrocardiographic signs with the pathology found at autopsy would indicate that coronary disease begins very early in this group of hypertensive patients.

TABLE V
Special Electrocardiographic Findings in Relation to Blood Pressure

Blood pressure	150	160	170	180	190	210	220	230	240	250
Number of cases....	9	29	21	14	6	4	5	2	6	2
Negative, per cent	100	52	57	43	50	25	0	50	0	0
L. V. P., per cent ...	0	14	19	14	33	50	60	0	17	50
Negative T's, per cent	0	7	0	36	0	50	80	50	83	100
Arborization block per cent	0	0	24	21	0	25	40	0	17	50
Depression and elevation S-T, per cent	0	7	0	21	16	25	80	50	50	50
Deep Q wave in lead III, per cent	11	..	14	14	0	0	0	0	0	0

RETINAL CHANGES

The study of the eyegrounds reveals perhaps the earliest and most direct information regarding the hypertensive process. Wagener believes that a majority of the patients with essential hypertension show some sclerosis of the retinal

arteroles. This may vary from a mild narrowing of the caliber of the arterioles to a marked thinning, tortuosity, and the presence of exudate or hemorrhage. The rate at which these changes occur are indicative of the prognosis in these cases. In the present series retinal changes are noted in 37 per cent of the group with a systolic pressure of 170. The changes are limited to a narrowing of the lumen of the vessels. In the group with a systolic pressure of 180, appearance of exudate together with the narrowing is noted in some cases. In the groups with a pressure of over 200, sclerosis is a constant finding and retinitis occurs in the majority of the cases. These findings are indicative of the seriousness and the progressiveness of the hypertensive process in these young men.

RENAL FUNCTION

While only a small percentage of the patients with hypertension die as a result of damage to the kidneys, yet, as will be seen in Table VI, disturbance of renal function, shown by the urinary findings, occurs very early. Albumin was noted in 13 per cent of the cases with a blood pressure of 160, and with increasing frequency as the blood pressure increases. Casts were found in five per cent of the cases with a blood pressure of 170, and a gradual increase in the percentage showing casts is noted in the higher pressures.

Sugar was found in a small percentage of the cases with a pressure of 150 to 170 and in none of the cases with a pressure of 180 or over. Why it should occur in the mild case and not in the severe ones is not known.

The tendency to renal insufficiency was studied by means of the phenosulphophthalein test, the water test, and the blood chemistry, but no correlation was found between any of these tests and the hypertension.

TABLE VI
Urinary Findings at Various Blood Pressures

Blood pressure	150	160	170	180	190	210	220	230	240	250
Number of cases	9	29	21	14	6	4	5	2	6	2
Albumin, per cent	0	13	5	14	33	25	80	50	50	50
Casts, per cent	0	0	5	14	17	20	60	0	50	0
Sugar, per cent	22	7	5	0	0	0	0	0	0	0

TABLE VII
Blood Chemistry in Relation to Blood Pressure

Blood pressure	150	160	170	180	190	210	220	230	240	250
Number of cases	9	29	21	14	6	4	5	2	6	2
Urea (av. amt. mgms. per 100 cc.)	13.6	14.0	13.8	14.0	12.4	13.1	17.0	19.0	17.0	13.0
Creatinin (av. amt. mgms. per 100 cc.)	1.6	1.6	1.6	1.65	1.6	1.7	1.8	1.85	1.6	1.45
Chlorides (av. amt. mgms. per 100 cc.)	478	437	445	453	487	450	453	482	521	393
Sugar (av. amt. mgms. per 100 cc.)	124	119	110	102	115	79	121	141	91	167

The results were practically within normal for all the tests and for all the blood pressures. The retention of metabolites in the blood, as shown by the blood urea, creatinin, and chlorides, was no greater in the cases with severe hypertension than in those with mild hypertension. The blood sugar also was within normal limit in all the groups. As we know that at least two-thirds of the kidney substance must be impaired before renal insufficiency occurs, the above findings are easily explained.

SUMMARY

The clinical picture as a whole is not very encouraging, and it can be stated that a young man can not carry the burden of an increased blood pressure for any length of time without escaping the consequences of the persistent elevation of pressure.

Clinico-pathologic signs of serious involvement of the heart, vessels, and kidneys can be detected in the majority of these young men after an average period of two years and with a systolic pressure of 170 millimeters and over, the extent and frequency of these signs increasing with the increase of the blood pressure.

Albumin in the urine was noted in 15 per cent of those with a systolic pressure of 160 millimeters of mercury.

Changes in the eye grounds were found in 37 per cent of the group with a pressure of 170 millimeters. Abnormal electrocardiographic changes indicative of myocardial damage and coronary disease were noted in 24 per cent of the group with a pressure of 170 millimeters.

With a pressure of 200 or over these signs of serious pathologic involvement of the heart, vessels, and kidneys are almost constantly present.

In conclusion, therefore, it may be said that as long as we know so little about the etiology of hypertension and the methods of its control, the brunt of the attack of this most important problem must be directed against the control of these early consequences of hypertension in young men.

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Diagnosis of Hyperthyroidism*

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THYROTOXICOSIS is easily recognized when seen in typical, well-marked cases with definitely enlarged thyroids. Diagnosis becomes difficult in mild cases, especially with little gland enlargement. It, also, becomes difficult when one or two essential symptoms are entirely lacking.

The greatest difficulty is distinguishing the neurotic individual with incidental goitre, colloid or adenomatous, from the mild, true thyrotoxic individual. It is distressing to operate such neurotic cases, having the neurosis go merrily on, or even become accentuated following operation.

Thyrotoxicosis occurs in exophthalmic goitre and in adenomatous goitre with hyperthyroidism. We shall not distinguish between the two groups since the symptoms in the main are nearly identical and the management is identical. The principal symptoms are: (1) enlarged thyroid, (2) nervousness and tremor, (3) loss of weight and strength, (4) increased heart action, (5) increased heat production, (6) exophthalmos, (7) increased B. M. R.

An analysis of these cardinal symptoms, as seen in the thyrotoxic and in the neurotic, seems in order:

I. Enlarged thyroid. Less than $\frac{1}{3}$ of enlarged thyroids seen will present thyrotoxicosis. Of adenomatous goitre seen after 35 years of age, about $\frac{1}{3}$ are thyrotoxic. Of proven thyrotoxic cases, 95% will have palpable thyroids. The neurotic patient is very likely to complain of pressure, choking, difficult swallowing due to his goitre, while the thyrotoxic individual says nothing of local symptoms.

II. Nervousness and tremor occur in many conditions. The neurotic individual complains at length of his nervousness, is usually pessimistic, but, nevertheless, always calm. The thyrotoxic individual mentions his nervousness, but is cheerful and optimistic usually, and as he recites his history, is constantly moving or shifting his extremities. These movements have been described by Plummer as 'peculiar, purposeless movements.' The thyrotoxic individual is over-

stimulated, always ready for more, often irritable to high degree—the neurotic may be irritable but usually feels inadequate. Tremor of hands and tongue of varying degrees, characteristically a fine tremor, practically always is present in thyrotoxicosis.

III. Loss of weight and strength is almost universal in thyrotoxicosis, and when it occurs in the presence of a good or increased appetite is almost pathognomonic, diabetes being excluded. Many high-grade thyrotoxic individuals present glycosuria as a result of their greatly increased metabolic processes and are occasionally mistaken for true diabetics. The neurotic may lose weight, but usually has a poor or variable appetite. The thyrotoxic case approaching a crisis often loses his appetite, however. These crises occur only in cases of high degree, and other symptoms of thyrotoxicosis are usually pronounced. The weakness of thyrotoxicosis is due to actual muscle degeneration, and is not described as a fatigue but an actual weakness. The patient feels he can do almost anything and is surprised at his inability to accomplish simple tasks. The weakness of the quadriceps group is often especially striking and of diagnostic importance.

IV. Increased heart action is evident by the persistent tachycardia and the increased pulse pressure. Both are almost constantly found. Found together they are almost pathognomonic of thyrotoxicosis. The patients complain often of the rapid heart action, often of the throbbing and pulsations in various parts of the body. In long-standing cases, auricular fibrillation or flutter, either paroxysmal or persistent, appears in about 20 per cent. We often see crises ushered in by paroxysms of fibrillation. The increased pulse pressure is not common in the neurotic who is more likely to have a low systolic pressure. The tachycardia of the neurotic is likely to be extremely variable, varying greatly from hour to hour. That if the thyrotoxic is more constant. Systolic murmurs at base and apex are common in thyrotoxicosis, and the presence of arterial bruits over the substance of the gland is common.

V. Increased heat production is shown by the

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patient's intolerance to heat and by the increased sweating. These are very common complaints in contrast to the neurotic, who, although he sweats profusely from axilla and hands, complains of always being cold. The skin of the thyrotoxic individual feels warm, and the examiner is often surprised to find the mouth temperature normal.

VI. Bilateral exophthalmos exists in about 50 per cent of cases of Grave's Disease. When not definite, or in individuals with naturally large or prominent eyes, this symptom leads to much uncertainty in interpretation. The peculiar stare of most thyrotoxic individuals is far more common than actual exophthalmos.

VII. Increased basal metabolism is always present. When we say 'always present,' we must qualify to this extent—certain individuals are normal at 15 to 20 per cent below the usual average. We all see plenty of these people. They have some group of symptoms which we are trying to explain or they have a dry skin or coarse hair; we do a metabolism, it is minus 20 per cent, but they feel no better or even worse when that rate is raised to normal by feeding thyroid. This group of people may be definitely thyrotoxic with rates of plus 10 or 15 per cent.

It should be emphasized that repeated tests are very often necessary in these questionable cases. It is not sufficient to accept the technician's notation "test satisfactory." Unless the results are compatible with the clinical findings, we must repeat tests again and again to be certain.

It must be remembered that basal metabolism is normally elevated to 20 or 30 per cent above normal in the latter half of pregnancy. Also, rates 20 to 30 per cent above normal are common in marked hypertension, so that hypertensive cases with goitre must be judged critically before thyroidectomy is advised. Other conditions less commonly met, which give rise to increased metabolic rates, are leukemia and polycythemia.

Activation of adenomata to hyperfunction is common following infection of any type, following surgery and undue psychic shock. The cardiac symptoms are likely to predominate in this group and these cases often masquerade long periods as primary cardiac disease. It is necessary to be "goitre conscious" and analyze concomitant signs and symptoms closely to recognize these cases promptly.

I have reviewed the histories of 334 thyroid cases, seen in the past five years, and have chosen a few illustrating what I thought were

interesting deviations from these usual characteristic symptoms, or some unusual features.

The first selected are three cases of exophthalmic goitre in sisters who presented themselves within a three year period. The first seen June 18, 1926, was referred as a case of tuberculosis. She had spent six months in a sanatorium four years previously. Present complaint, stomach distress and diarrhoea, dates from 'stomach flu' six months previously, had 8 to 10 stools daily for two months (no blood, no mucus, but severe cramps); now three to four stools daily, semi-formed, no cough, wind short, heart pounds on exertion, fever to 99.5 occasionally, always feels too warm, strength poor past six months, knees especially weak.

Examination: Skin too warm and of peculiarly soft fine texture, fine tremor hands, nails typical of exophthalmic goitre, blood pressure 140/70, pulse 112, temperature 99.2, thyroid enlarged grade I, firm, symmetrical, bruit present left upper pole; X-ray of chest showed healed tuberculosis, BMR plus 67.5 per cent; stools negative for parasites. The two sisters presented typical cases of no special interest in themselves. This case illustrates the readiness with which patient and doctor are satisfied to attribute all existing symptoms to some known condition. Both were satisfied that the old T. B. had become reactivated. The symptoms of T. B. and thyrotoxicosis are similar; yet, the motor unrest, the leg weakness out of proportion to general weakness, the heat intolerance out of proportion to increased temperature pointed the way to a correct diagnosis. In this case, the fingernail signs, that is, marked separation of nail from matrix, were marked. Of these three cases, two returned with recurrences. Lugol's did not control them, but X-ray and Lugol's did.

The next are two exophthalmic cases in mother and daughter. The mother at 30 had typical exophthalmic goitre with marked exophthalmos and spontaneous remission. She remained well until 63, when we saw her because of sudden auricular fibrillation. The attack began during the night, she rapidly developed nervousness, tremor and protracted vomiting; in other words, a typical crisis of exophthalmic goitre. She responded perfectly to Lugol's solution. Thyroidectomy was refused, and she has remained in comparative health by the intermittent use of Lugol's solution. The daughter at age 24 presented herself with exophthalmic goitre with extreme exophthalmos, and was operated.

We have come to look upon paroxysmal auricular fibrillation as being highly significant of

thyrotoxicosis and do not feel satisfied until it is definitely excluded as the etiologic factor.

The next case illustrates the life history of a rather unusual goitre. Female, age 28, seen July 14, 1930, goitre noted at four years, so large that dresses could not be buttoned. Treated by iodine, and completely receded. From age 10 to 14, gradual enlargement till choking present; iodine treatment for three years, complete recession except nodule in each side; iodine stopped because of marked generalized skin reaction. From age 18 to present time, age 28, gradual enlargement. December, 1929, (six months), began to lose appetite. April, 1930, began to become nervous and weak, (3 months), especially weak in legs, heart palpitation. June, 1930, began vomiting, and has retained very little past month, weight loss 109 to 76 pounds.

Examination—Gland firm, hyperplastic type with some adenomas, bruits present, pulse 120, BMR plus 76 per cent. Vomiting ceased after third day on Lugol's; two weeks later, weight gained; 10 pounds and BMR plus 10 per cent; thyroidectomy done. It is interesting that she had no ill effects from the iodine at this time; also, that she presented loss of appetite as the first symptom in her hyperthyroidism.

Next, three cases of juvenile hyperthyroidism—the first at age 14, presented herself in 1924 with typical exophthalmic goitre. Thyroid enlargement five years, past two years very nervous, talks faster than usual, basal rates plus 43 and plus 37. Trial with radium, three treatments, X-ray one series. Thyroidectomy. Marked improvement. Recurrence 1926, rates plus 30, plus 20. Goitre became huge, irregular, adenomata, exophthalmos increasing, very irritable, uncomfortable. Re-operation 1928. 1929 rates minus 8, minus 10. 1930 recurrence—rates plus 20, plus 30. X-ray treatment, exophthalmos still marked. January 1931 remained well. These recurrent cases take the joy out of thyroid management.

Another juvenile case, age 14, referred as chorea, October 1928. Onset nervousness and headaches summer 1928. Past month much worse, very restless, constantly moving arms, legs, hands, feet and head. Pulsation felt in ears nights. Short of breath on exertion, weight loss 13 pounds, no heat intolerance. Examination: Constant movement of all extremities, struma with bruit, quadriceps weakness III, fine palpable tremor, nail signs questionable, pulse 120, blood pressure 130/80, BMR plus 43 per cent, checked plus 36 per cent. Diagnosis: In chorea we might find all these, but pretty likely

one extremity would predominate in the motor unrest. In chorea BRM is often elevated but not so high as plus 43 per cent. Eight days after Lugol's, rate was plus 24 per cent, operation; complete recovery. Seen seven months later, BRM minus 10.4 per cent, gained from 109 to 133, complete recovery.

The third juvenile, age 11, is presented because of history of psychic shock, seen October 5, 1928. Parents had noted presence of enlarged thyroid for several months, but no consideration given it. Then was bitten by a dog, "went all to pieces," vomited, very nervous, gradually improved but never well since, and when seen eight months after the episode, had shortness of breath, palpitation, feels heart beat in temples, very restless, thrashes about in bed all night. Examination: Moderately enlarged, firm, smooth gland with bruits over both poles. Lugol's started.

Basal rates plus 70%	10/8/28
plus 33.4%	10/24/28
plus 16.7%	11/24/28
plus 50%	1/10/29
Operation	2/24/29

Here we have an illustration of the temporary curative effect of iodine. 10/5/29 plus 10, 2/8/30 plus 17. Clinically Well.

Our pediatrician has brought to our attention a group of children with hurried speech, tendency to stammering, thin, delicate type, tending to repeated infections with BMR's plus 20 to plus 40. Marked improvements occur with Lugol's, metabolic rates drop, they fall in step with others, and infections become much less frequent.

The next cases were chosen because they had masqueraded as nerve exhaustion for several months, and had likely escaped proper diagnosis because of the unusually low pulse rates they persistently ran.

A priest, age 64, seen in April 1928, ill since fall of 1927 when he became greatly exhausted during the extreme heat. Has been excitable, nervous and weak since. Spent all winter since December in hospital and sanatorium. Diagnosis, nervous exhaustion, weight loss 52 lbs., appetite poor at first, good now past four months, but has not regained his weight. Adenoma left lobe thyroid 4 cm. in diameter, smaller right lobe blood pressure 155/80, pulse 60 to 66, heart 4/13/cm systolic murmur apex, E. C. G. sinus rhythm, no significant changes. 4/30/28 BMR plus 37; 5/1/28 plus 38, Thyroidectomy; complete recovery. 1/26/31, weight 212, must reduce.

A similar but less severe case—a master mechanic, age 57, poorly for two years, has seen

many doctors because of nervousness, poor memory, easily tired and palpitation on least exertion. Examination: definite fine tremor of hands, blood pressure 100/70, pulse 60 to 64 several observations E. C. G. sinus rhythm, BMR 3/18/30 plus 23.8%. 3/24/30 plus 20.4%. Lugol's started; 11 days later 4/5/30 plus 15.6%; in ten days more 4/15/30 minus 6.3%; after six weeks 5/6/30 minus 12.9%. Gained three pounds first week on Lugol's. Last seen January 1931; reports himself entirely well.

The next patient, contrary to all rules, had gained weight steadily from the onset of her illness. Girl, age 23, seen August 28, 1929. Complaint: Entirely tired out since hot spell of July, sweats more than usual this summer, "When others are comfortable, I am too warm." Weight gained from 106 to 124 during this period. Gland enlarged grade II, diffuse, smooth, rather soft, eyes stare, no exophthalmos, blood pressure 110/80, pulse 120. 9/3/29 BMR plus 36.4% 9/6/29 BMR plus 23.3%, 9/18/29 BMR plus 18.4%, pulse 128, leg weakness definite. Lugol's started. 9/28/29 BMR plus 8%, pulse 110. 9/30/29 Operation. 11/5/29, Pulse 78, no tremor, weight 121, returned to work. 12/19/29 Edema of orbital tissues and increasing exophthalmos. BMR minus 20.2%, minus 20, minus 12, minus 13.4. Later, thyroid and Lugol's no relief; Lugol's no relief. Given thyroid extract without relief; interfered with work; finally went to Mayo Clinic,—no suggestions.

Dr. Leo Zimmerman reported 8 such cases two years ago. Dr. Roeder of Omaha reported at the Seattle meeting of American Association for the study of goitre six cases with marked exophthalmos in individuals with low basal rates; those showed no influence by iodine; marked increase in exophthalmos by thyroid feeding, and no relief by surgery. I have seen enucleation necessary in one such case. Dr. Naffziger of San Francisco has decompressed orbit, saving the eye sight.

The last case is an example of the group described by Levine, presenting themselves with anginal pain.

Female, age 35, seen first June 10, 1931. Complaint, pain in left chest, begins near apex of heart, extends inward to sternum and radiates down left arm to elbow. When severe also radiates to right arm. Reaching, stooping, stair climbing bring it. Several night attacks, waking her and making her sit up to breathe. Duration five to ten minutes. Examination: Heart 3.5/9 cm., sounds at apex not of good quality. Rate 110, blood pressure 110 systolic, 68 diastolic, E. C. G. negative, b. 60%, RBC 3,900,000. Treatment, bromides, no relief, one week. Nitroglycerin trial, with immediate relief of attacks; required 5 to 15 tablets daily. Treatment, anemia, bromides.

August 23, BMR plus 42.2

Still 5 nitro glycerin

Hemoglobin normal, count 4,300,000.

August 24 BMR plus 29.6

Sept. 1, BMR plus 45.6 Lugol's started

Sept. 9, BMR plus 21 Pulse 80

Pain much less, strength improved.

Sept. 21 BMR plus 19.9, practically no pain

Oct. 27 BMR plus 8.8, no pain

Dec. 7 BMR plus 10.9, no pain, does all work

Jan. 18 1932 BMR minus 12.2

Mar. 1st BMR plus 4.4 Lugol's two weeks each month

Apr. 18, BMR minus 4.6 Feels she is well.

The patient's brother died following thyroidectomy, so operation will not be advised unless urgent need demands it.

In conclusion: Typical severe thyrotoxicosis is easily recognized. Mild cases must be carefully looked for, as they may present predominant cardiac or gastrointestinal symptoms. They may masquerade as general debility following infections or as chronic nervous exhaustion. The most difficult group to differentiate is the neurotic with incidental goitre, and this can be done by minute appraisal of symptoms and signs, together with correct interpretation of carefully determined metabolic rates, amplified when necessary by therapeutic trial with iodine administration.



Congenital Atresia of the Jejunum*

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THE first record I have found of atresia of the small intestine is that of a case of atresia of the duodenum reported by J. Calder in 1733. Thomas in 1884 reported a case of complete absence of the jejunum, ileum and the greater portion of the colon. In 1922 Davis and Poynter collected a total of 401 cases of intestinal occlusions, of which sixty were in the jejunum. A. Thorndyke, in 1927, found an incidence of one case of some form of atresia of the intestine in 9,288 births.

A limited search of the literature indicates to me that atresia of the jejunum is of rare occurrence.

The etiology of atresia of the jejunum is rather obscure. Bland-Sutton believed that atresias occur at the site of embryological events. Jabouley and Wyss attribute the condition to vascular failure. Defective intestinal rotation and congenital constricting bands may be the causes of some cases.

The case I have to report is that of an infant with multiple atresias of the jejunum. The patient, a female weighing five pounds at birth, was delivered prematurely at about the end of the seventh month of gestation. It cried loudly, and seemed well developed. It was given the usual care for premature newborn, and took water and nourishment well during the first day. The next afternoon it vomited a small quantity of greenish fluid. It had not passed any meconium, and an enema was returned clear. The enema was repeated a few hours later, and again returned clear, with a moderate sized plug of mucous. It continued to take nourishment. About midnight of the second day it vomited the second time, and the vomitus was again a greenish liquid. Following this second emesis it began to regurgitate the water and food, and soon began to vomit large quantities of dark colored fluid which contained some blood. It had passed no meconium, and repeated enemata were returned clear. Digital examination of the rectum was negative, and a barium enema showed that the colon filled. It was given a transfusion of the mother's blood and seemed to improve. It rested well, took nourishment and did not vomit for six

hours. It was given liquid petroleum and atropine sulphate, but the vomiting began again and became more persistent, projectile in type and more bloody. Another transfusion of the mother's blood was given, and also glucose and normal saline. The vomiting, however, persisted, and no results were obtained from enemata. The upper abdomen was distended, but no signs of intussusception or volvulus could be elicited. A diagnosis of complete obstruction somewhere in the small intestine was made and laparotomy under local anaesthesia was performed on the third day. On opening the abdomen the greatly distended stomach and duodenum occupied most of the upper abdominal cavity. The duodenum ended blindly at the ligament of Trietz. There was a complete absence of the upper end of the jejunum for a distance of $1\frac{1}{2}$ inches, then there was a segment of jejunum $\frac{3}{4}$ -inch long, blind at both ends, then a second complete absence for $\frac{1}{4}$ -inch, then another segment of bowel five inches long, blind at both ends, then another complete absence of one inch. Following this the small intestine began as a blind pouch and extended a distance of $13\frac{1}{2}$ inches to joint the colon at the ileocecal junction. The cecum and appendix were present. The appendix was $1\frac{1}{4}$ inches long. The segments of small intestine all had lumens, though they, as well as the colon, were somewhat smaller than normal. The mesentery was present at the locations of the defects. There were no bands present and in so far as could be determined, the blood supply was not defective.

An anastomosis was made between the duodenum and colon. The patient withstood the operation well, but continued to vomit and expired ten hours later.

At autopsy everything was found normal, except the multiple atresias of the jejunum.

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THE NEW YEAR

The leaf has been turned. A new page appears. On which to write new year's resolutions? No, no such figments. This is real. It is a new chance. This page is not for resolutions but performances. It is given to each "*carte blanche*" on which to indelibly and unchangeably write life's history as it unfolds day by day, not as resolved, but as willed and executed. Resolutions, like wishes, fears and hopes, are ephemeral.

Lasting records are made by deeds and accomplishments. We marvel at the wisdom of regeneration exemplified as it is by this new year of opportunity in which each may share without distinction, favor or prejudice. May cherished designs be consummated and treasured hopes resolve into fruition.

A. E. H.

PAPER X-RAY FILMS

The value of the X-ray film in diagnosis has been recognized. One great difficulty has been the cost of the X-ray film, particularly when one wishes to make an inventory of chest conditions in large groups of individuals; in fact, the cost has often made survey work prohibitive. A small group has advocated the use of the fluoroscope as a substitute for films. There is no doubt that the fluoroscope will often aid in the detection of some lesions which do not cause abnormal physical signs but it is also true that the fluoroscope does not bring out as fine detail as the X-ray film and, therefore, a good many cases of frank tuberculosis are overlooked when one depends upon fluoroscopy. There is a considerable advantage in

having a record of the shadows for subsequent comparisons. These, of course, can only be had through the X-ray films. The fluoroscopic examination is usually made by one person over a brief period of time and the report represents his interpretation, whereas, the X-ray film may be viewed by a number of physicians and be preserved as a permanent record.

In the spring of 1931, the Board of Managers of the Queensboro Tuberculosis and Health Association were desirous of determining whether the tuberculous lesions in the chests of children readily detectable by means of X-ray constitute the group of cases in which clinical tuberculosis later develops. For this purpose in co-operation with the Department of Health and Education and the Medical Society of the County of Queens, the Association considered entering upon a four-year program of observation of the chests of at least ten thousand school children. The best methods of examining and keeping under observations the chests of these children were discussed but the cost of celluloid X-ray films was obviously a considerable handicap.

The use of paper instead of celluloid as a vehicle for the X-ray emulsion had come to the attention of the president of the Association, Mr. Henry C. Wright, and through a local engraving company experiments were made which resulted in the manufacture of a paper film which can now be obtained from Powers X-ray Products, 205 W. 39th Street, New York City.

Two questions immediately arose: First, is the paper film approximately as good as the celluloid film in recording shadows of lesions, et cetera, in the chest? Second, can it be produced at a sufficiently low cost to justify its use? Dr. Margaret Witter Barnard of the Bellevue-Yorkville Health Demonstration became interested in this film and in collaboration with Dr. J. Burns Amberson, of the Bellevue Hospital, and Dr. Marion Loew decided to make a comparative study of celluloid and paper films made of the

same chests in one thousand cases. In their preliminary report they call attention to the fact that the paper film consists of fairly tough and stiff white paper base coated on one side with a sensitized emulsion and that it is used practically the same as the celluloid film. When it is developed, it is viewed by direct illumination and by bright daylight. They find that the best artificial light is obtained from a one hundred watt bulb behind a sheet of daylight glass. When the films are made stereoscopically they must be viewed in a stereoscope with a special illuminating device.

The following quotation from their report seems significant: "Generally speaking, it may be said that the celluloid film is appreciably superior for showing shadows of fine detail. Nevertheless, the paper film approximates the desired standard very closely, and, under certain circumstances, may prove to be an acceptable substitute. In our hands the cost of the finished paper film has been found to be about half that of the finished celluloid film at present market prices." Finished paper films of chests have already been demonstrated in different parts of the country and it would now appear that they will be far superior to physical signs and fluoroscopy in the detection of chest lesions.

J. A. M.

MEDICAL FUTURITY

The railroads have been almost ruined by the private passenger cars. Their future lies in consolidations, few stops and reduction of trains.

The financier sees England and France convert their government bonds into reissues paying a little over half of the old interest rate despite the fact that the franc has lost 80 per cent of its pre-war value and in twenty-four hours, Premier Herriot carried this, his greatest triumph, through the house of deputies. Changes are swiftly made, Snowden, Sinclair and Samuel resigned from the British cabinet. The Ottawa conference marks a turning point in the world's history. Italy feels that France cheated her at Versailles and wants to see the French Hegemony broken. Hitlerism steadily grows in Germany. Von Hindenberg, disheartened, considers political renunciation. Will Hitler, with a brown shirt army be the II Duce of Germany? Certainly Mussolini would not be displeased at this. Class war is on in Russia. The peasant uses a passive warfare toward the industrial worker and strikes him in the most vulnerable spot, namely, his stomach. The peasant will not have collective farm markets and the industrial worker cannot subsist without

food. The peasant will gamble at long odds for the victory of emancipation.

Peace assurance would save a tremendous expenditure to the world. Japan has ruthlessly dismembered China, what value treaties, leagues and pacts? It would be easy to prevent war if legislation was made and enforced against the exportation of war munitions but this would antagonize the great international business of manufacture of war materials. The "Cannon Internationale" is one of the most powerful world forces, embracing, as it does, the house of Krupp, the house of Hotchkiss, the house of synder representing the Skoda factories and many other rich and powerful corporations, many of which are engaged in the manufacture of automobiles and vehicles in peace time and, in times of depression, naturally seek to keep their factories running by the manufacture of war munitions. So important is the friendship of these great institutions to national security that unneeded orders are given to these houses to insure their friendship in times of necessity. From 1925 to 1932 large shipments of war munitions were made to Japan and China. Lately South America has become a heavy buyer so it is not hard to foretell where war will occur.

From 1915 to 1930 America reached its medical Andalusian epoch and became the greatest national medical entity and held its place in that stratosphere, nonchalantly defying the law of gravity. Greatness is to some extent an attitude, but it requires much money to sustain it. When money goes, standards go. We are seeing an era of growing collectiveness where the individual commands less and less space and authority. We are witnessing a struggle between the Midas medical regime and the Bourgeois standards that must follow the terrible decrease in medical finances. So is the insecurity of securities.

The vital query is, how shall adequate medical and surgical services be rendered in the future at the cost which the average citizen can meet and at the same time allow a living wage for the medical man? From recent survey, there is a 25,000 over-supply of doctors in the United States. Different propositions are discussed. We may go bag and baggage to state medicine or adopt collective bargaining from groups of individuals. Other plans, less worthily motivated, are in the offing. The American people will hardly endorse state medicine. Much has been done along the line of collective bargaining for medical care and it presents the professional, the financial and the administrative side.

The first Annual American National Association of Labor Meeting was held at Madison,

Wis., in 1907, due to the efforts of the late Prof. Henry R. Seager.

The essence of insurance is risk. Commercial health insurance was first written in the United States in 1847. In 1850, accident coverage was added and in 1865 the Travelers Insurance Company began writing such insurance. This form of insurance increased in popularity until the last few years during which years the depression so increased the moral hazard that very little straight health insurance, without prohibitive restrictions, is now written.

Collective bargaining by groups of individuals has been promulgated largely in communities representing the textile, forestry and mining nuclei. The Baylor University Hospital in Dallas, Texas, has been one of the outstanding successes in collective bargaining but it covers only hospital accommodations and limits rigidly the number of days per year obtainable under each policy. They have some thousand members, over one-third of which are teachers.

For surgical and medical care very few collective bargaining groups have been able to continue except in localities where competent men could only be retained by the continuity of the groups. These clubs have best flourished in mining districts, not adjacent to large cities and can exist only while the dues paid equal expenditures. The qualitative question is a big factor, as it is in compensation insurance. Bills for choice of physician by patient under compensation laws were defeated in New York, New Jersey and Kentucky, and this augurs ill.

Few medical men, in the future, will have the spark of genius necessary to command sizable incomes as individuals.

C. Da. W.

FRANKLIN A. DODGE, M. D.

The passing of Dr. Franklin A. Dodge, veteran physician of Le Sueur, Minn., brings to a close, a life, which was consecrated at an early age, to the service of humanity. Throughout his long and useful life, his mission was to aid others in distress, and help and comfort those in need.

Known throughout the state, and in his home town for his outstanding work as a physician, he was equally well known for those sterling qualities, which enable us to call a man, a true friend. His knowledge, his understanding of human nature, and his love for every living thing, made him sought as an advisor, and as an author-

ity, where careful thought and deliberation were needed.

Slow in his decisions, fair in his judgments, he was loved and respected by all who knew him. No man or woman was too humble for his kindness and consideration. Rich or poor, high or low in station to him, all men were created equal, and he showed no discrimination.

Despite the manifold interests which absorbed him, he found time for recreation, and was particularly fond of fine horses. A true sportsman, "A man to all the country dear" his inestimable service to mankind cannot be measured.

The results of his efforts and the example of his beautiful life will endure. Sorrow and discouragement only made him more magnanimous in his judgment, and kinder and more patient to those whom he served.

Franklin A. Dodge was born at Beetown, Wisconsin, on October 11, 1862. His father and his grandfather, were also physicians, making him the third in the generation of doctors in his family.

Dr. Dodge went to St. James, Minn., in 1880, where he worked in a drug store for eight months, before beginning the study of medicine. In 1883 he took lectures at the Minnesota College Hospital, after which he entered the Medical School of the University of New York where he completed his course in 1886. He went to Le Sueur that same year and opened an office with his brother, Dr. Wm. Dodge. He has been a practicing physician in Le Sueur for 46 years, and was still actively engaged in his work at the time of his death, which occurred from pneumonia, on December 6th, a disease which he had been unusually successful in treating.

Dr. Dodge was never too busy to take time for that which concerned others. He was never known to be too much in a hurry, too tired or too busy, to refuse to help another. For that reason, besides the countless interests which absorbed him in his profession, he was active in the business and social affairs of the town, and in various organizations which pertained to the medical world.

Dr. Dodge was a leader and worker in his local state and national medical societies, being a member of the American Medical Association for nearly 30 years.

Besides his only daughter, Mrs. George Ulmer Jr., of Minneapolis, Dr. Dodge is survived by three brothers, two sisters, and many other relatives.

WILLIAM H. MAGIE, M. D.
1853-1932

This pioneer surgeon of Minnesota, at the Head of the Lakes, passed away at Duluth, December 11, 1932.

He was, indeed, a conspicuous and brilliant figure and a leader in the development of surgery in Minnesota. He had been in ill health for about four years. An indefatigable worker and persistent attendant at all medical gatherings, he was very widely known and greatly respected for his honesty of purpose and high ethical and professional ideals.

He lived through a period in northeastern Minnesota which history will point out as an extremely active transition through lumbering to lake shipping in the development of one of the world's greatest centers for the mining and utilization of iron ore.

Born in Madison, New Jersey, educated at the St. Louis Medical College in St. Louis, he located in Duluth in 1881. He was closely identified with the St. Benedictine Sisters and the development of the St. Mary's Hospital; its records show that in 1881 he operated successfully for a case of appendicitis. He became surgeon for the old St. Paul & Duluth railroad and for the Duluth & Winnipeg line. Later on he became closely identified with the employees of the Duluth, Missabe & Northern railway, and later, when the Steel Company opened the hospital at Morgan Park, he was its surgeon and chief, and held that position up until his health failed him.

Like most pioneer surgeons of his time he travelled extensively to surgical centers within our own country and courageously sought to apply, that which he had seen taught and demonstrated. Illustrative of this, he did the first gastroenterostomy done in Duluth in 1885, using the method then used by McGraw of New York—an elastic ligature placed within the anastomosed area, where it cut itself through.

The early lumbering, through "tickets" sold to the lumberjacks, brought to St. Mary's hospital a very great number of badly injured men. Dr. Magie was wise in his emergency treatment, courageous in his fracture technique and taught many men at the Head of the Lakes, who have since proven themselves very worthy physicians.

He was married twice. His first wife bore him two children, still living, and his second, who died three years ago, bore him two sons, who are still living.

His own profession honored him with the

presidency of the State medical society some twenty-five years ago, and he long remained closely identified with those in our state highly zealous for maintaining our best medical traditions. He was early associated in Duluth with Dr. S. H. Boyer, a quite recent past president of our State society. He was trained at a time when the physician's physical and mental faculties and general judgment were indeed standard equipment for those who would succeed. Those who have read the older surgical literature of some thirty years ago will recall a brilliant technical surgeon, Dr. Bernays of St. Louis. Dr. Magie frequently quoted him. Within a much closer period they will have a vivid recollection of the great John B. Murphy and Albert Ochsner of Chicago. The older men in Minnesota will not have forgotten the late Charles Wheaton of St. Paul and James Dunn of Minneapolis. It was indeed such vigorous and commanding personalities which stimulated Mid-western surgery to such an extraordinary degree. Toward the epoch making development of the Mayos at Rochester (within the same period) Dr. Magie had an attitude of admiration and respectful appreciation of the Mayos' teachings, and more than any other man in northeastern Minnesota pioneered to bring to it the benefits of modern surgery.

E. L. T.

NEWS ITEMS

Dr. O. J. Engstrand, formerly in practice at Warren, Minn., is now located at Minneapolis.

Dr. F. A. Willius, Rochester, was guest speaker at a recent meeting of the Rockford, Ills., Medical Society.

Dr. A. H. Borgerson, formerly in practice at Hewitt, Minn., has moved to Sebeeka, where he will take over the practice of Dr. E. A. Lodmell.

Dr. C. S. Raadquist, Hibbing, Minn., has been spending several months at the University of Minnesota, taking a post graduation course in X-ray therapy.

Dr. B. T. Bottolfson, Moorhead, Minn., who has been spending the last few months in Vienna, Austria, has returned home and again resumed active practice.

Dr. R. W. Mullen, was named to head the medical staff of the McKennan Hospital, Sioux

Falls, S. D., for the coming year, with Dr. P. R. Billingsley, first assistant.

Dr. C. A. Hegge, who had practiced medicine at Austin Minn., for over 36 years died suddenly at his fruit ranch in Texas, where he had resided the last few years.

Dr. Adolph Hanson, Faribault, Minn., has been awarded patents establishing his claim to the discovery of paroidin, an extract which is used in the cure of tetany and convulsions.

Dr. Andrew V. Rock, Mobridge, S. D., died suddenly last month from a heart attack at the age of 54 years. Dr. Rock was a graduate of the Creighton School of Medicine, at Omaha.

Goodhue County Medical Society held their annual meeting at Red Wing, Minn., and elected Dr. J. F. Brusegard, president Dr. E. H. Juers, vice-president, Dr. L. A. Steffens, secretary.

Dr. E. Starr Judd, of the Mayo Clinic staff, was elected a member of the executive committee of the Western Surgical Society, at the annual meeting recently held at Madison, Wis.

Dr. Richard R. Cramer was elected chief of the medical staff of Asbury Hospital, Minneapolis, at their recent annual meeting. Dr. Cranmer has been an active member of the staff for over 20 years.

The Sioux Falls Medical Society officers for this year will be, president, Dr. L. J. Hannon, Hartford, vice-president, Dr. C. W. Forsberg; Sioux Falls, secretary, Dr. Geoffrey Cottam, Sioux Falls.

Dr. H. M. Hodgson, Crookston, Minn., was elected president of the Red River Valley Medical Society, with Dr. Edward Bratrud, Thief River Falls, vice-president, and Dr. C. L. Oppengaard, Crookston, secretary.

Dr. Thomas Myers, St. Paul, was the guest speaker before the members of the Redwood-Brown Medical Society, held at New Ulm, Minn., last month. Dr. Myers presented a paper on "Simplified Infant Feeding."

The Black Hills Medical Society held their annual meeting at Deadwood, S. D., and elected the following officers for 1933: Drs. N. E. Mattox, Lead, president; F. Radusch, Rapid City, vice-president; J. L. Stewart, Nemo, secretary.

Dr. Paul H. Burton, Fargo, president of the State Medical Society, was a guest speaker at a joint meeting of the doctors and dentists, recently held at Jamestown, N. D. Dr. Burton presented a valuable paper on "State Medicine."

Dr. Catherine A. Burnes, one of the first woman physicians to practice in Minnesota, passed away last month at the ripe age of 83 years. Dr. Burnes was the first woman to be graduated from the University of Minnesota in 1886.

The Kandiyohi-Swift County Medical Society held their annual meeting last month at Willmar, Minn., and elected the following officers: Drs. H. H. Jensen, Atwater, president; H. Hutchinson, New London, vice-president, and L. C. Scofield, Benson, secretary.

At the annual meeting of the Watertown, S. D., Medical Society, held on December 13th the following officers were named: Dr. A. E. Johnson, president; Dr. H. M. Freeburg, vice-president, and Dr. M. C. Jjorgenson, secretary. Four new members were elected.

At the winter meeting of the South Dakota Eye, Ear, Nose and Throat doctors held at Mitchell, brought out a large attendance with a very interesting program of speakers being presented. Dr. C. E. Yates, Lawrence, Kans., Dr. C. N. Spratt, Minneapolis, Dr. R. M. Miller, Madison, S. D., and others presenting papers.

Closing of nine-tenths of the nursing schools in the United States, including practically all of the "trade" type, will be recommended by Dean E. P. Lyon of the University of Minnesota medical school and other members of an investigating committee, before the Association of American Medical Colleges, at its annual meeting in Philadelphia.

All practitioners of medicine and surgery holding licenses to practice in Minnesota are required by law to be registered annually during January, with the secretary of the board of medical examiners, and at that time to pay a fee of \$2. A licentiate who practices without renewing his license is guilty of a misdemeanor and is subject to prosecution.

Dr. J. M. Murdock, Faribault, president of the Rice County Medical Society, recently entertained the members of the society at a dinner, after which a regular meeting was held. Dr. Murdoch was re-elected to the presidency. Dr. C. N. Spratt, Minneapolis, gave an illustrated lecture on "Eye Operation," after which Dr. W. R. Webb, also of Minneapolis, delivered an address on "Drainage in Appendicitis."

Dr. C. C. Smith, of Mandan, S. D., was elected president of Sixth District Medical Association at a meeting held following a dinner at Bismarck. Other officers named are Dr. M. W.

Roan, Bismarck, vice-president, and Dr. L. W. Larson, Bismarck, secretary and treasurer. Papers were read by Dr. W. H. Bodenstab, Bismarck, who spoke on "Medical and Surgical Conditions in Relation to Workmen's Compensation," and by Dr. R. H. Waldschmidt, Bismarck, whose topic was "Fractures of the Spine."

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). Speakers: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month of January will be as follows: January 4, Mitral Stenosis; January 11, Carbon Monoxide Poisoning; January 18, What Is Hyperacidity?; January 25, Ovarian Tumors.

All practitioners of medicine and surgery holding licenses to practice in North Dakota are required by law to register annually on or before January 1, with the secretary-treasurer of the board of medical examiners, and to pay a fee of \$5, if a resident of North Dakota, or \$2, if a non-resident. A practitioner may not practice if he has not registered. If he nevertheless continues in his practice his license may be revoked and can be reinstated thereafter on the payment of the delinquent fees and 50 cents for each month of default.

The mid-year meeting of the South Dakota Academy of Ophthalmology and Otolaryngology was held at Mitchell, December 4th, which brought out a large attendance to enjoy this interesting program: Dr. C. E. Yates, Lawrence, Kansas, paper on "Trachoma"; Dr. C. N. Spratt, Minneapolis, moving pictures on Pocket flap operation for "Cataract and Sclerecto," "Iridodialysis for Glaucoma"; Dr. R. A. Kelly, Mitchell, presented a patient with "Carcinoma of the Eyeball," and one with "Thrombosis of a retinal artery"; Dr. R. K. Miller, Madison, a paper on "Osteomyelitis of the Petrous Portion of the Temporal Bone"; Dr. R. B. Gregg, Sioux Falls, a paper on "Intraocular Tumors."

The fall meeting of the North Dakota Academy of Ophthalmology and Otolaryngology was held at Fargo, October 22nd, Dr. Axel Oftedal, Fargo, presiding. The scientific program was furnished by Dr. A. D. Prangen of Rochester,

who delivered a very interesting and valuable address on "The Surgery of the Ocular Muscles," with slide illustration. Dr. E. B. Bannister of Grand Forks was elected to membership in the Academy. Dr. Geo. M. Constans extended an invitation to the society to meet for the spring meeting at Bismarck, and his invitation was accepted. At 1:00 o'clock, luncheon was served, after which the Academy adjourned to the State College Stadium to witness the Homecoming football game between the University and State College. Dr. Rolfe Tainter, Fargo, was in charge of local arrangements for this very successful meeting.

A jury returned a verdict of not guilty in the case of Minnesota vs. Collen. The defendant, 46 years of age, was tried on an information charging him with practicing healing without a Basic Science Certificate. The State claimed that the defendant had rendered treatment to Mrs. Kirsten Jacobson of Dennison, Minn., following an automobile accident. In that accident Mrs. Jacobson sustained a colle's fracture and a fractured patella in addition to other cuts and bruises. When the defendant was asked for his bill he made a charge of \$15.50 which later was settled for \$7.50. Collen operates a store in the village of Dakota in front of which there is a sign reading "Drugs and Wholesale Chemicals." On cross examination the defendant admitted that he was not licensed as a pharmacist in the State of Minnesota, nor was he registered under the Basic Science Law. He claimed to have certain credentials in the State of Illinois under the Pharmacy Laws, but these were not produced at the trial.

BOOK NOTICE

PRACTICAL PREVENTION, OR THE TECHNIQUE OF BIRTH CONTROL. Wm. J. Robinson, The American Biological Society.

The author is (he assures us) The Pioneer of the modern birth control movement in America. This book of 165 pages discusses the various methods of prevention (more popularly known as contraception) and discusses their indications and contraindications. The book will be of value to those physicians who desire a volume on the technique of birth control, prevention or contraception.

SOCIETIES

YANKTON MEDICAL SOCIETY

The annual meeting of the Yankton District Medical Society was held December 16, 1932. The following officers were elected for the ensuing year: President, Dr. Ina Moore Freshour; vice-president, Dr. F. J. Abts, and secretary-treasurer, Dr. J. A. Hohf.

The first number on the scientific program was "Misplaced Placentas and the Effects on Labor," by Dr. James F. Taylor, of Sioux City, Iowa. The doctor spoke from notes with illustrative chart of the uterus with its adnexa. Many valuable points upon this important subject were presented as well as upon the important work of obstetrics in general.

The next paper upon "Undulant (Malta) Fever in South Dakota," by Dr. H. Klima, of Tyndall, S. D. Dr. Klima discussed the prevalence of this disease in this state, giving in detail the clinical signs, symptoms and etiology; also his personal experience with a recent case.

Dr. Thos. A. Duggan, of Wagner, S. D., followed with a report of a case of "Undulant Fever," giving also in detail, the signs, symptoms and course of the disease as observed by himself in a recent case. The appearance of this disease seems to be a new discovery in this state, according to these doctors.

Dr. J. C. Ohlmacher, of Vermillion, discussed briefly the pathology of "Undulant Fever," stating that there was very little in the way of pathological findings. Dr. Hunter, of the State Laboratory, spoke upon the findings in a series of blood examinations made for other conditions in which there have been routine agglutination tests made for Undulant Fever. He found that approximately one-half per cent gave a positive test. Similar tests were made of blood from hogs and cattle, the blood having been obtained from slaughter houses and approximately fifty per cent of these animals gave a positive test. There were upwards of a thousand examinations made in each of the foregoing.

Dr. J. R. Westby, president of the State Medical Association, was a guest of honor. He spoke briefly upon the pending medical legislation that is to come before our state legislation in January. Dr. Westby then presented two twenty-minute movie reels, the first was Morphology of the Cancer Cell and the other Radium Treatment of the Breast. These pictures were exceedingly interesting and instructive.

There was a good attendance at the meeting and the medical student body of Vermillion was present.

J. A. HOHF,
Secretary.

CLASSIFIED ADVERTISEMENTS

WANTED

A Mays Ophthalmoscope in good condition. State best price. Address Box 75, Grafton, N. D.

FOR SALE

Office practice and equipment in one of the leading cities of South Dakota. This office has been occupied by the same physician for the past 45 years. Address Box 947, care of this office.

POSITION WANTED

Experienced young lady wishes position as doctor's assistant. Can do shorthand, typing, and bookkeeping; also, some laboratory experience. Caroline Rose, 1511 Thomas Ave. No. Cherry 0972.

POSITION WANTED

Young lady technician wishes position in hospital or doctor's office, doctor's office preferred. Experienced in X-ray, physical therapy, and laboratory, and two years of nurses's training. Good references. Address Box 942, 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.

PRACTICE FOR SALE

Will sell general practice complete in good farming community of southwestern Minnesota at a bargain. Equipment is all practically new. Share waiting room with dentist. Office in good condition, steam heat, low rent. Practically no opposition. Am going to specialize. Address Box 945, care of this office.

FOR SALE

Well equipped office in an unopposed location established over 20 years covering large territory in good farming district eastern South Dakota. Nearest competition 25 miles. Most suitable for young doctor who is willing to live in small town. Priced reasonable for quick sale. Leaving because of University appointment. Address Box 944, care of this office.

FOR SALE OR TRADE

This is a fine outfit that some one can have cheap. One complete X-ray equipment consisting of: One practically new late model Acme 6:60 Transformer with controls. 220-volt, 60-cycle current; one combination horizontal and vertical radiographic and fluoroscopic Victor Table equipped to do stereo work; one Universal X-ray Timer, 110-volt, 60-cycle current; one complete Dark Room equipment consisting of Tank and modern accessories. Address Box 950, care of this office.

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Drainage in Appendicitis*

ROSCOE C. WEBB, M.D.

Minneapolis

NOT LONG ago I spent five hours operating on one patient who had been improperly drained for appendicitis. He had had a fecal fistula for eleven years. When he swallowed food it would appear on his abdomen in about twenty minutes and when he was given a rectal injection it appeared immediately on his abdomen. During these eleven years he had been unable to work and he had been under treatment in various institutions. My operation was, as near as he could remember, number fourteen. A stiff rubber tube had been placed through the wound down into the pelvis and had caused a slough of the rectum and of the jejunum or ileum with fistula formation. Ordinary attempts at closure had been unsuccessful. I made a barn door incision and isolated the involved ileum and performed a resection of the fistulous portion and anastomosis of the ends. I was unable to get to the rectal fistula safely and was compelled to leave him with it. He promptly gained in weight and strength and was partially restored to health and ability to work.

Appendicitis is one of the most common surgical conditions and appendectomies are extremely common operations. However, the mortality rate is increasing. At times I have had occasion to recall the statement of that

master surgeon, Dr. John M. T. Finney, that appendectomy when easy is the easiest and when hard may be the hardest operation we are called upon to perform.

There are undoubtedly many young surgeons who have never seen a patient recover from appendicitis without operation. They are so well aware of the necessity of early operation that the patient who refuses is sent elsewhere. I have a very vivid recollection of my first experience of this kind. During my House Surgeonship I took a vacation at sea as a ship surgeon. Off the coast of Costa Rica a Portuguese stoker developed appendicitis. Those days were among the more fastidious ones of my life and after investigating the nearest available hospital I decided on the non-operative treatment. I was greatly relieved when we returned to New York and my patient was definitely over his attack.

Two years later on returning from France in a less fastidious frame of mind and with one hundred and twenty five disabled soldiers in my care, one of these soldiers developed acute appendicitis while we were on the high seas and as usual in the middle of the night. The operation was performed according to rank. The senior officer made the incision and after a half hour or more he changed places with the assistant who then found and removed the appendix. The waves of the ocean did

*Presented at the Forty-fifth Annual Meeting of the North Dakota State Medical Association at Grand Forks, June 1 and 2, 1932.

not embarrass the work of the assistant. Again the recovery was uneventful.

The fact that each of these patients recovered, one without operation and the other with operation does not exactly answer the question as to the increasing mortality from appendicitis. I have no doubt that in each instance you have formed your own conclusion and I shall leave the decision to your judgment.

In the publications on appendicitis we find articles of various lengths, chapters on the various phases and volumes of varying sizes and shapes. Much in connection with this subject has been proven, agreed upon and standardized particularly up to the point of dealing with the appendix stump. One of our great American surgeons who has now passed to his reward said that "No man can become a great surgeon until he invents a new way of inverting the stump of the appendix." The subject is not yet settled. The last number of our leading American surgical publication had a ten page article telling us not to invert the stump at all. I am also tempted to digress at this point and enter this phase of the discussion.

We have briefly touched upon the frequency of this disease, the increasing mortality, the need of early operation, the difficulties which may be present, the need of competent surgery, the treatment of the appendix stump and one of the complications of improper drainage.

Although there are some complications of appendicitis occurring in cases not requiring drainage the majority of the complications occur in those which must be drained and some of the complications could be eliminated with proper drainage.

In the course of an ordinary surgical practice the number of serious cases of appendicitis under one's care at one time is fortunately not large. In fact the situation is somewhat analogous to that of compound fractures. When, however, his treatment was applied to hundreds and thousands of patients with compound fractures and patients were exposed to the observations of other physicians who were often superior officers, the deaths, amputations and other complications involving morbidity and permanent disability were such as to arouse an introspective and at least a respectful interest in the minds of the most competent surgeons.

The world's best surgical minds were turned in this direction. Civil surgeons of great prominence were required to spend a period

of weeks in observation in front line hospitals. I recall no more pathetic sight than that of a thoroughly competent surgeon who had not profited by his period of observation and as a result was pulled out of the operating room because his post operative results were obviously unsatisfactory.

Let us consider the complications which may result in connection with the cases of appendicitis requiring drainage.

1. Death
2. Intestinal obstruction
3. Septicaemia
4. Fecal fistula
5. Subphrenic abscess
6. Residual abscess
7. Infected wound
8. Prolonged morbidity
9. Ventral hernias
10. Post operative complaints

If a group of surgeons were each given a large number of previously healthy individuals with appendicitis requiring drainage and their results were subjected to the criticism of trained impartial observers I believe the experiment would be of value in the future treatment of appendicitis.

When we open the abdomen and find an acute appendicitis we immediately consider the stage of the disease from the practical standpoint of whether or not drainage will be required. We examine the appendix to see whether or not perforation has occurred.

We consider the wall of the cecum about the appendix base as to how it will affect our treatment of the stump.

The presence of fluid in the abdomen is of interest. If it is clear or but slightly cloudy we make a culture and also a smear which is immediately reported upon. If pus is present we want to know how well it is walled off and whether or not there is a localization of pus elsewhere in the peritoneal cavity.

Drainage in the borderline case may be omitted on the theory that the peritoneum will be able to take care of the small amount of infection which may be present. After closing the peritoneum however, it is well to consider drainage of the remainder of the incision. The walls of the incision may be infected and the secretions of the wound if not allowed to escape may afford a medium for the development of wound infection. We wish to discourage the drainage of a clean wound as poor surgery but on the other hand a folded rubber dam or Penrose tubular rubber dam drain to

the peritoneum for twenty four or forty eight hours may prevent or reduce wound infection.

When a drain is thus inserted for prophylactic purposes it should be removed early because there is no doubt but that a drain affords a mode of entrance for secondary infection and if a drain is left in long enough there will eventually be an infection present in the tract. Furthermore if the drain is inserted into the peritoneal cavity there is the additional danger of the production of unnecessary and avoidable adhesions.

When the appendix is frankly gangrenous in a small area or surrounded by a small amount of turbid fluid and the fluid and appendix have been removed, a drain to the appendix region is advisable. One or two tubular rubber dam drains brought out through a convenient point in the abdominal incision is our usual procedure. The use of a stab incision to the right of the operative wound has advantages in case the operative wound does not become infected. I feel, however, that drainage of the operative incision itself is of importance and is obtained when the drain is brought out through the original incision.

No doubt there are some present who recall the old cigarette drain. When this type of drain is used in the presence of infection it serves as a drain by capillary action only until it becomes saturated and when it is removed it is followed by a gush of pus. This has accounted for its being called a cigarette cork rather than drain.

When we discover an appendix which has ruptured and a diffuse peritonitis existing we have good reason to be apprehensive as to the outcome. It is in this type of case that we wish to give our patient the maximum in drainage. In an endeavor to insure the escape of this deadly material, glass tubes and tubes of stiff rubber are often used under the misapprehension that they will insure drainage over a longer period of time. Such drains are placed into the pelvic cavity and if left long enough they are certain to cause necrosis of the wall of nearby intestine and secondary hemorrhage may also occur. If a moderately stiff rubber tube is inserted into the pelvic cavity it should be shortened frequently and removed entirely in forty eight hours to prevent formation of a fecal fistula.

In a case of diffuse peritonitis it should be remembered that it is impossible to drain the general peritoneal cavity. Drains are encap-

sulated by adhesions within a few hours. Furthermore widespread fluid by no means always indicates widespread infection.

The area about the appendix may be considered to be most severely infected. This area may well be comparable for practical purposes to the area involved if the walling off process were complete and an abscess had been formed. We must next consider the pelvic region as a possible infected area and thirdly the lateral gutter between the ascending colon and the lateral abdominal wall.

When the surgeon is presented with a situation of this type he desires maximum drainage and this is often obtained by placing numerous drains in the wound, often cigarette drains with special drains to the lateral gutter and the pelvis and the incision is then closed about these drains as well as possible.

The drains are then systematically loosened each day. The drains to the lateral side are removed first and the medial drains later and when the last drains are removed and followed by a gush of pus the wound is irrigated until the infection has subsided.

When the wound which has been closed about these drains becomes infected as so frequently occurs the pus gathers above and below the various sutured layers. The skin and fat are first widely opened. We finally despair of the fascia and cut the chronic sutures and separate the muscle down to the peritoneum. Much to our relief the intestines at the peritoneal level do not pop into the wound but are held fairly well in place by the adhesions which have formed. The patient's temperature begins to subside. The sloughing fascia is now holding up the healing of the incision and we snip it away with scissors a little more each day until we finally have a healthy appearing wound which after five to seven or more weeks is healing sufficiently to allow the patient to go home.

It may be that this course is modified by apprehension of the surgeon as to a post operative hernia and the wound edges are somewhat approximated by adhesive plaster straps. Much of the infected material is thus retained, the temperature does not subside as quickly and the sloughing of the fascia progresses further, rendering a post operative hernia more certain.

May we compare this exaggerated picture with that obtained when an appendix abscess or case requiring maximum drainage is treated with the rubber dam tampon of Gibson. Rub-

ber dam is obtainable by the hospitals in square yard sizes. When cut in four parts it affords pieces of rubber dam eighteen inches square which is a proper size for our purposes. It is folded two or three times in the form of a cornucopia. The apex which will eventually be the lowest point of this dam is snipped off making a hole above this, the edges of the cornucopia are cut out making a perforation about one half inch in diameter and a second and third row of perforations is made higher up about one inch apart.

The tampon is then introduced as follows: After the appendix has been removed and the cavity sponged out, the operator carries the tampon into the cavity, the index finger being placed at its apex. The pads and retractors may still be in place. The edges of the rubber dam are spread out and while the operator still keeps his finger on the apex, the tampon is filled with strips of packing. The cavity is usually overstuffed in order to push the gut and omentum well away from the incision in the abdominal wall. As a rule it is not necessary to place any sutures in the wound. A large loose wet dressing is applied. At the end of twenty-four hours the outer dressing is removed, the edges of the rubber dam are loosened around the wound and the gauze packing is partially withdrawn in order to allow better drainage. This process is repeated each day, removing a greater amount of gauze each day and it is all removed by the fourth or fifth day and the tampon is also removed or it is left in place and a small amount of fresh gauze is reintroduced. It is preferable to remove the entire rubber dam at this time and

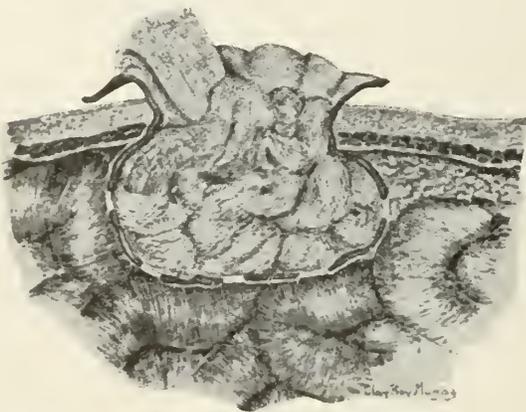
replace it with folded rubber dam drainage, the amount depending on the size of the cavity. At this period one of the principal advantages of using the tampon will have been obtained; namely, the permanent pushing back of the abdominal contents from the wound cavity, and there is now left a well defined, walled off cavity which can be drained with great ease. There is no longer need for wide open drainage and the small rubber dam drains will suffice. As the wound closes, the abdominal walls come together over the abdominal contents, which, inasmuch as they were held back at the outset, will not intrude into the wound as a wedge driving the edges apart.

Let us again consider the complications and discuss relation to this drain. Inasmuch as this drain is used only in the more severe cases a certain percentage of deaths may be expected. The presence of maximum drainage combined with perfect wound drainage should be of value in reducing mortality but absolute statistics can not be available. Intestinal obstruction cannot be positively reduced to figures but there is a minimum of loose ends extending out among the loops of bowel and permitting entanglements. Septicaemia is best treated and prevented by maximum drainage. Fecal fistulas are undoubtedly reduced to a minimum and when they do occur there is usually sufficient distance between the bowel opening and the abdominal incision to permit closure without a later operative procedure.

Subphrenic abscesses may have as one of the causes, extension of the infection and exudate especially up the lateral gutter. The drain placed in this gutter with a maximum drainage about the site of origin of the infection should minimize the occurrence of subphrenic abscesses from this cause. Residual abscesses are reduced to a minimum by the subjection of the widest possible area to drainage.

Infected wounds with prolonged morbidity do not occur when this drain is applied as outlined. Perfect drainage of each layer of the abdominal wall insures against the occurrence of the wound infection as we so often see it. Patients die of infected wounds in other parts of the body. When one is struggling against the ravages of an abdominal infection such as occurs in some cases of appendicitis the additional burden of an infected wound may cause the loss of the battle.

Ventral hernias can not be prevented by catgut in the presence of severe infection. To



Schematic drawing of Gibson rubber dam tampon illustrating the packing away from the wound of the intestines and omentum and the free drainage of the layers of the abdominal wall (Gibson Ann. Surg.).

the uninitiated the lack of sutures in the abdominal wound arouses the greatest misgivings. First of all we have a life at stake rather than an abdominal incision. Nature next comes to our rescue and forms adhesions which hold the intestines back from the incision. The incision heals in a clean and healthy manner with all of the layers intact. If the drain has not been properly applied and the "inwards" do later bulge into the incision the ventral hernia which may occur is easily repaired because the layers of the abdominal wall and particularly the fascia are still present and intact.

This drain covered with rubber dam and without a painful tender infected wound is mercifully comfortable and reduces post operative complaints to a minimum.

Conclusions:

Appendicitis is a properly dreaded disease and we will all undoubtedly continue to have a mortality among the cases which do not come to the surgeon soon enough. When we are presented with such an infected case we should approach as nearly as possible the wide open method of treatment which is a rational and accepted method in other parts of the body.

In the method of drainage advocated there is nothing to prevent additional drainage of the pelvis, lateral gutter et cetera, and all of the additional refinements of treatment of the severe case of appendicitis will of course be kept in mind.

DISCUSSION

DR. EDGAR A. PRAY (Valley City): The question of drainage in appendicitis is a big problem. In our hospital recently we had nine cases of laparotomy at one time. Most of these patients came in in a serious

condition, largely because of the present depression. I think I can add nothing to Dr. Webb's paper, but his ideas of the Mikulicz operation I think should be of exceptional value in the things we all have to contend with. Some of us remember when hospitals were not available, in the early days in North Dakota, and the drains we used, the conditions we contended with successfully in those days, show that drainage is not so imperative as to the type of drains used, but the wonder is that so many patients recovered under the treatment we were compelled to use. Hard rubber drains and glass drains were used and we had many rectal fistulae and many more obstructions than we have now because of the hard tubular drains which caused compression and kinking of the intestines. Now we know that these should not be used, and if tubular drains are employed they should be soft rubber and of good size. The question is to keep the intestine well packed so that when the cavity heals there is ample outside drainage.

I wish to compliment Dr. Webb on presenting this subject, for while it is old it is always of interest. I remember hearing John B. Deaver say that this is not an operation that is done only by tyroes. It is being done by many young men, the seats of whose breeches are still warm from the benches of the lecture room.

DR. A. L. CAMERON (Minot): I wish to commend Dr. Webb's paper, and to express my approval of this type of drainage. I learned it through Dr. Webb at the University Hospital and have been using it for ten years. It has many advantages that other types of drainage do not have. It expedites hospitalization, and from the standpoint of drainage it does all one wishes, does no harm, and is consistent with a very low mortality. In a series of fifty-odd cases I recently looked up, the mortality was less than five per cent, and I accepted all types of cases for operation. I always insert three drains, one lateral to the ascending colon, one to the stump of the appendix, and one in the pelvis, in addition to the Mikulicz-Gibson pack. It might be mentioned that the pack can be easily made with a rubber glove if no other material is at hand.

Fractures of the Lower End of the Tibia and Fibula*

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FRACTURES of the lower end of the tibia and fibula are very common. So much has been written about them that it may seem superfluous to add to this great amount of good literature. But because they do occur so frequently, and because each fresh fracture case is a new problem in itself, it may be worth while reviewing some of the more important points, and

to call to mind some of the things that we have all learned in the past but that often slip our memory.

An important factor in doing good fracture work is to know the anatomy, not only in a general way but in an accurate and detailed way. The better we know our anatomy the easier it is to know what to do and to comprehend when we have the broken parts in correct position and alignment. In fractures involving any joint, ac-

*Read at the meeting of the Great Northern Railway Surgeons Association, Duluth, Minn., June 20, 1932.

curate reposition is far more important than in the shaft of a long bone. In general the closer to a joint a fracture is the more accurate and exact must be the reduction. Fractures about the ankle joint must be very exactly and very accurately reduced, if the patient is to have a comfortable and useful walking leg. A very little malposition of any bone fragment, a small amount of widening of the joint, a very small amount of abduction or of inversion will leave a joint that will cause pain on walking and more or less disability. Accurate and exact reposition of every fractured bone is very important. It is equally important to hold them in correct position until union is so strong that they will not be pushed or forced out of position by muscle pull or by weight bearing. Because one person can start walking six weeks after his fracture does not mean that every one can do so. Each fracture is a case to itself, and must be watched and studied carefully until we are sure union is strong. It is more important to watch the fracture after the cast has been removed and exercise started than while it is in the cast. Daily observation is even more important when weight bearing starts. It is then that frequent X-rays should be taken; if the patient is having much pain or soreness it is a warning that he is starting weight bearing too soon. If the ankle seems to be widening or the bone fragments appear to be slipping or sliding away from the correct position or getting out of alignment, it will be necessary to postpone weight bearing, and may be necessary to reapply a cast or some other appliance.

Anatomical landmarks that should be remembered include the difference in the two malleoli; the external malleolus is one-half inch longer; it is narrower and more pointed; it lies opposite the center of the angle and is about one-half inch behind the internal malleolus, which is a little in front of the center of the foot. The line of the crest of the tibia in front, if extended down will strike the tubercle of the scaphoid, an important point in backward displacement of the foot. The scaphoid tubercle can be felt on the inner side of the foot about an inch below and a little in front of the internal malleolus. On the outer side of the foot the head of the fifth metatarsal is a prominent landmark that can always be felt; while just in front of fibular end is the smooth sharp edge of the upper articular surface of the astragalus, a valuable landmark. Just below the external malleolus and a little forward can usually be felt the peroneal tubercle or trochlear process of the os calcis lying between the tip of the external malleolus and the head of the fifth meta-

tarsal bone. While the center and upper part of the tibia is triangular in cross section it should be remembered that the lower third of the bone is circular and smaller, which accounts in part at least for more fractures occurring in the lower end, the circular shape being weaker than the triangular shaped part higher up. The articular surface at the distal end of the tibia is practically at right angles to the shaft of the bone. Motion of the tibiofibular-astragular joint is limited almost exclusively to the anteroposterior plane by the two malleoli and their lateral ligaments; dorsiflexion to about seventy degrees and plantar flexion to about 140 degrees being allowed in the average. There is almost no lateral motion in the ankle joint proper. Lateral motion and rotation are all made in the joints between the tarsal bones and in the torso-metatarsal joints. A very important fact to remember in ankle fractures is that the flexor muscles in the back of the leg, the gastrocnemius and soleus are much thicker and stronger than the extensor muscles in the front of the leg. To overcome this, these flexor muscles must be relaxed as much as possible in fractures by bending the knee during reduction, and in cases of marked displacement the knee should be kept flexed until union is well started.

Terms that are confusing to those of us who are not orthopedists and who are not doing a great deal of fracture work include flexion, extension, dorsiflexion, and plantar flexion, supination and pronation. If we will remember that the plantar surface of the foot corresponds to the palm of the hand, these terms become simple and easy to remember. We naturally associate flexion of the fingers with bending the same is true of the toes; likewise extending the fingers and toes causes them to be straightened; plantar flexion is natural enough, but dorsiflexion, which is extension, is confusing. Similarly the terms supination and pronation, while easy to remember in connection with the hand, will be just as simple if we remember that when we pronate the hand we rotate it in the direction that places the palm downward, and a similar direction applies to the foot; while supinating turns the back of the hand outwards and downwards and the dorsum or top of the foot outwards. In other words, pronating rotates the hand and foot inwards and supinating rotates outwards. Generally speaking every dislocation of the foot in whatever direction, is associated with a fracture of the tibia or fibula or both. A very few anterior and still fewer posterior dislocations have been reported without fracture, but they are almost negligible. In the lateral dislocations one or both malleoli are broken

and in the posterior and anterior dislocations the posterior or the anterior edge of the tibia is also broken, in addition to the malleolar fractures.

The most common ankle fracture is the eversion or abduction type, with fracture of the external malleolus and often complicated by fracture of the internal malleolus. This causes an abduction, or outward displacement, of the ankle, and usually a widening of it also. In the more severe eversion fractures the posterior edge of the tibia is also broken, allowing a backward displacement of the foot in addition to the eversion. Occasionally, though not commonly, the eversion fracture may be complicated by a chipping of the anterior edge of the tibia, causing a forward dislocation of the foot, in addition to the eversion. Inversion fractures usually involve more of the tibia than just the malleolus, the fracture extending up the tibia further, and these are usually associated with a fracture of the external malleolus as well. When the fracture is more severe, inversion fractures are associated with a breaking off of the anterior edge or even the anterior part of the distal articular surface of the tibia, causing a forward dislocation of the foot. Fractures just above the ankle usually involve both bones; the fracture being frequently oblique or spiral, and the deformity varying in direction. These are more common in children, and when transverse are likely to be green stick fractures. With fractures about the ankle there is always tearing of the ligaments, and injury to the soft parts, causing great swelling and ecchymosis in most cases. If the bones are properly replaced and kept in good position these ligaments heal without special treatment.

TREATMENT OF FRACTURES ABOVE THE ANKLE JOINT

In a child with a simple spiral or oblique fracture without much displacement, reduction under anesthesia, followed by a cast, will usually be very satisfactory. The cast should extend from the tip of the toes on the plantar surface to the knee, but allowing the dorsal surface of the toes to be uncovered for motion. If this cast is unpaddinged, the toes must be watched closely for several days, and if any interference with the circulation follows, or if pain occurs, the cast must be cut its entire length, or even removed, if slitting does not relieve the pain and swelling. If removed, a new cast should be applied as soon as the swelling is gone. If a green stick fracture is present, it must be thoroughly reduced before applying the cast. In older persons with fracture of both bones above the ankle with but little or no displacement the same

treatment will give a good result. But if there is a marked displacement of either the tibia alone or of both bones, extension, with the leg supported in a cast and the knee kept flexed, will usually be necessary. For this the Kirschner pin through the os calcis is very satisfactory. It is the easiest form of skeletal traction to apply, and the most satisfactory for after care. By injecting 5 cc. of 2 per cent novocaine one and one-half inch below and one and a half inch behind each malleolus, making a short cut through the skin to the bone on each side, the rustless steel wire can be very easily and quickly pushed through the bone with the Kirschner outfit, the bow attached and fifteen pounds weight applied; a small sterile dressing should be applied to the skin on each side where the wire comes through the skin. A moulded cast is applied to the plantar surface of the foot from the tips of the toes, and extended up along the under surface of the leg to the flexed knee. This is then held in place by a circular cast, and the entire leg placed on a Braun leg rest, or one of similar design, which keeps the knee flexed, allows extension, and is fitted with an attachment to keep the foot upright. This traction should be continued for at least three weeks, after which the leg is enclosed in a snug circular cast for six weeks or more. During this latter period he may be allowed to walk on an iron walking heel. After that an elastic bandage may replace the cast, but during the first few weeks the leg must be watched closely. If pain follows, or if any X-ray shows that the fracture is not strong enough, more time must be given before further weight bearing is allowed.

FRACTURES AT THE ANKLE JOINT

Practically all ankle fractures come under two forms, the eversion type or the inversion type. In a few of these the displacement is so slight that one cannot be certain whether it is a fracture or a sprain until the X-ray is taken. But in nearly all there is a displacement either outward or inward and the eversion type far outnumbers the inversion type. In all these fractures one must make certain there is not also a break of the posterior or of the anterior edge of the distal end of the tibia. In the more severe fractures this very often occurs—the fracture of the posterior edge of the tibia with a backward displacement of the foot commonly occurring in eversion fractures giving both an outward and a backward displacement, while the fracture of the anterior edge of the tibia commonly occurring in severe inversion fractures, resulting in forward displacement of the foot in addition to its being

displaced medially. It is very important to recognize these fractures for if they are not noticed and the proper steps taken to correct the displacement and to keep them in right position a poor result will always follow. In all ankle injuries an X-ray in both the anterior-posterior and in the lateral planes should be taken. It may be easy to make a diagnosis without the X-ray, but from a medico-legal point of view it is absolutely necessary. An anesthetic is always advisable and nearly always necessary. Local anesthesia is very satisfactory in these cases, injecting 10 to 20 cc. or two per cent novocaine into the site of the fracture on each side. In reducing these fractures it is far easier if the knee is kept flexed at a right angle to relax the powerful flexor muscles behind the tibia and fibula.

In a simple eversion fracture the important factor is to make as strong pressure as possible over the outside of the ankle while holding the leg above the ankle solid. Too much inversion pressure of the distal ends of the tibia and fibula cannot be made; this does not mean inversion of the foot but of the distal end of the tibia and fibula. Having reduced the fracture completely hold it firmly in this position until the cast is applied and is set enough to be strong. Before applying the cast make sure that the foot is well dorsiflexed and slightly pronated so as to avoid a flat foot. Böhler recommends pressing upward on the head of the fifth metatarsal bone to cause pronation of the foot, keeping the heel in a neutral position—neither inverted or everted. A molded plaster cast is applied to the plantar surface of the foot and the posterior aspect of the leg from the tip of the toes to the flexed knee, keeping strong inversion pressure on the distal ends of the two bones all the time. Then a circular cast is applied from the base of the toes to the knee. If there is a posterior displacement due to fracture of the posterior edge of the tibia as well as eversion, the heel must be brought forward strongly in addition to inverting the ankle, and the foot held in marked dorsiflexion. In very severe fractures in which the posterior part of the distal end of the tibia is badly broken it may be necessary to use continuous extension in addition to the cast in order to hold the fragments in correct position; for this the Kirschner pin is very satisfactory when pushed through the os calcis, fifteen pounds weight applied, and the cast put on as before but being split if a good deal of swelling is present as is usually the case. The extension should be continued for four to six weeks and then a new cast applied without

the extension for another six weeks. This second cast may be extended half way up the thigh and a walking iron heel attached and the patient allowed to walk. As soon as the cast is applied another X-ray must be taken in both directions to make sure that the reduction is complete. Böhler claims that a lateral deviation of 0.5 mm. will cause pain and arthritis afterwards if not corrected. The position must be very accurate to give a good and comfortable walking leg. If the films show any deformity the cast should be removed at once, the malposition corrected, and a new cast applied. This should be done immediately, not the next day. Fractures require immediate attention; the sooner a fracture is reduced the easier the reduction and the better the result. Inversion fractures require a similar treatment except that the distal end of the tibia and fibula must be pushed outward instead of inward. In the more severe inversion fractures there is usually a break of the anterior edge of the tibia. If this does not involve more than the edge itself a backward pushing in addition to the outward push will correct the deformity. But if more of the anterior part of the distal end of the tibia is broken it may require extension in a cast to hold the fragments in position. In very bad fractures of this type it may be necessary to hold the foot in marked plantar flexion in addition to traction in a cast.

I believe all severe compound fractures of the ankle joint should, after a careful debridement, be placed in a cast with skeletal traction. This sometimes seems difficult to carry out on account of the danger of infecting the traction hole in the os calcis. But usually the wire or tong can be placed far enough away from the fracture opening to avoid this danger; I feel sure that traction in these cases is very essential. Absolute rest of the parts is very necessary in compound fracture and the extension plus the cast is far more effective than the cast alone. Böhler advises closing every compound fracture as soon as it is cleaned thus converting the compound fracture into a simple one; this can be done in some cases, but I have not felt capable of doing it in all cases. One must be quite certain that all infection and every piece of tissue that may later slough, whether bone or soft parts, has been removed; if this can be done it is of course better to close the wound.

How long should the cast be kept on a broken leg? Until there is no danger of muscle pull, gravity, or use, causing the growing bone to get out of position. This will vary with the age of the patient, the severity of the fracture, how

badly the soft parts, and especially the circulation, is injured, and the general condition and type of the patient. In some people broken bones unite rapidly and in others slowly; a fracture in the middle or lower third of the tibia unites very slowly if past middle age, and frequently even in younger persons. Fractures at the ankle itself often grow faster. Probably fractures of the lower third of the tibia require at least ten weeks in a cast on the average and some a great deal longer. In ordinary ankle fractures without much displacement usually six to seven weeks in a cast is sufficient, but if marked displacement was present several weeks longer may be necessary, and in very severe fractures extension for six weeks in a cast and a second cast without extension for another six weeks may be required. During a good deal of the time that the cast is on the patient can be walking with an iron heel which gives the muscles more or less exercise, aids the blood circulation, and is a big help in preventing atrophy. After removal of the

cast one must watch the patient closely; swelling of the leg does not mean much, but pain is a signal that must be heeded. Continued or severe pain means that the union is not strong and a new cast may be needed for a few weeks longer. Repeated X-rays should be taken and if there is any tendency for the bones to slide or get out of position or if they are getting out of alignment and the eversion or inversion, or an anterior or posterior bowing developing, weight bearing must be stopped at once and usually a new cast applied.

SUMMARY

Know the anatomy thoroughly.

Make strong pressure on the outer side of the distal end of an eversion fracture, and on the inner side of an inversion fracture.

Look for fractures of the posterior or the anterior edge of the distal end of the tibia in all cases.

Insist on very accurate reduction.

Hold in accurate reduction.

The Cultural Method of Tuberculosis Control

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WITH the solid foundation of knowledge acquired thru experiences and research studies of Koch, Lampson, Opie, Krause, J. A. Myers, Corper and others, we learned how to diagnose and identify pulmonary tuberculosis. Recently, the care and control of children so unfortunate to have contracted tuberculosis from an infected member of their family was placed under the guidance of institutions such as the Lyman-hurst School in Minneapolis.

In the past few years the epidemiologist has enlarged his scope to include tuberculosis. This is relatively a new development and is proving to be of considerable aid in the control of this disease. His aim, as in any other contagious disease, is to remove both the manifest clinical and carrier cases from the community. By removing the source, the infection rate diminishes and the disease tends to disappear.

The method of case control, being in its infancy, is naturally a crude and inefficient one. It is up to the family physicians, tuberculosis workers, and others interested in the well-being of the human race to mold, thru experience, a finer and more efficient means of determining the character of the manifest and carrier cases.

The technique of uncovering carrier cases must be improved sufficiently so that we can free any community of such possible carriers. All such cases must be brought to light; they must be conscious of their possible danger to associates.

The present method of determining open cases of tuberculosis is thru the examination of the sputum. This is performed by spreading a film of sputum, about 1/100 of a centimeter in volume, on a glass slide. With the aid of dyes and thru the microscope, the technician attempts to see the stained bacilli. The number of bacilli must be sufficient in number so that the small amount of specimen will produce a positive reading. It is probably that the smear may be negative and yet the sputum positive. In other words the number of bacilli in the specimen may be so limited that they are not present in every minute sample.

To understand the situation clearly one must appreciate the pathology and physiology of the tuberculous sputum. Normal sputum is a combination of secretions from the salivary and mucous glands of the entire respiratory tract. Purulent sputum has abnormal discharges from the diseased tissues added to it. When the

disease, as tuberculosis, is in the parenchyma of the lung, then the respiratory passages act as a fistula allowing the discharge to drain from the diseased process to the outside. In its passage it is diluted by the normal secretions from the various glands. The sputum sent to the laboratory will contain all these elements.

The amount of discharge in relation to the other elements of sputum varies as to the amount of slough from the ulcerated areas. In cases where the ulceration is limited, the amount of discharge will also be limited. Besides this ulceration, one must also realize that the presence of mucus in a bronchiole may produce a plug with valve-like action and thereby allow, irregularly, the passage of the bacilli-laden discharge into the respiratory tubes.

The frequency of bacilli in a specimen would therefore depend upon several factors. First, the amount of ulceration; second, the presence of bronchial plugs. These factors would determine whether or not the small amount of sputum used in the test could produce positive evidence.

One should not be content with the diagnose of negative sputum for reasons above stated, that when the bacilli are few, they are likely to be absent in the small amount examined. 1/100 of a centimeter represents a very small fraction of the usual two to six ounces expectorated by the tuberculous individual.

The questionable results obtained from this sputum test led to the concentration of the specimen thru the use of various acids and alkali. This test has its merits but is limited. To date the most accurate means is the inoculation of guinea pigs, which has the advantage of being accurate, but the cost and number of animals required makes it a lessor used as well as an impractical method.

The limitations of various tests have stimulated investigators to study ways and means of uncovering some method whereby the tubercle bacilli, no matter how few, would be brought to view. Various media for the growth of tubercle bacilli have been found, each having some individual merit. The great number of such media so produced, would indicate that as yet they have not reached their expected efficiency.

Corper¹ initiated the use of what he calls tissue substrate micro culture in which he uses either blood or egg yolk. The specimen is concentrated and then planted on this culture media. His results have been noteworthy. Out of 100 sputa negative by the ordinary sputum examination, 53 revealed positive results after growth on the media. The results compare favorable with

the inoculated guinea pigs which were used as controls. If his work is confirmed by others, then we must admit that a negative sputum test is of little or no value in itself. The fact that Corper revealed over 50 per cent errors in the sputum tests as performed today, would indicate the grave danger in a negative sputum. The importance of this potential error is most likely to appear in public health work and sanatorium management.

As to public health, the epidemiologist in his field is confronted with the appearance of new tuberculosis cases in a community. His investigation shows that there is a possible link of these new cases to a so-called apparently arrested individual. On survey, this individual informs him that his sputum on examination was reported as being negative, and that he could not possibly transmit the disease. If the investigation is carried no further, then the epidemiologist would not be able to identify this potential carrier. However, with the thought in mind that approximately 50 per cent of the negative sputum reports are in error, the investigator would then complete his survey by the use of some finer analysis. If this individual does belong to the 50 per cent class, then one can easily perceive the danger he is to his associates. In order to insure against the out-break of new cases, we must uncover all the carriers that would be positive thru the guinea pig or cultural methods.

In the Sanatorium the present trend is three-fold—to protect the public, the employees of the sanatorium, and the patients from themselves. The public is protected by the isolation of the patient in the sanatorium. The employees and patients must be shielded in more definite isolation.

Geer was the first in Minnesota to realize the danger of infection to the employees. He instituted what he calls "medical asepsis" and employs contagious technique in the care of the tuberculous patient.

H. A. Burns² has gone further. He separates the positive from the negative sputum cases and with the medical asepsis, not only guards the employees, but also protects the healing and primary cases from re-infection.

In order to carry out this regime, it is necessary to be certain that a patient is or is not discharging bacilli from his diseased processes. The importance and need of a finer sputum screen is also brought out in the classification of tuberculosis. We must change or alter our classification to such an extent that the character of the sputum will coincide with changes in the

x-ray plates and physical examinations. The diseased process must either be recessive with negative sputum as shown in all the various tests including culture, healing or healed x-ray findings, stationary physical findings, and normal clinical records; or active with the opposite findings. If we are to make the sputum one of the deciding features in this classification, then we must be sure of its positive or negative character.

To illustrate further the need of a finer test than that used in the sputum examination of today, the sputum record of all resident patients at the Minnesota State Sanatorium were reviewed.

DIRECT SMEARS AND ZIEHL-NELSON STAINS

—NEGATIVE—						Discrepancy Negative and Positive		Total Cases
Reces- sive Type Sp. Neg.	Pri- mary Infec- tion	Mani- fest Clini- cal Cases	Mani- fest X-Ray Cases	POSITIV Mani- fest Clinical	Mani- fest X-Ray	Reports Alternate Pred. Pos.	Pred. Neg.	
110	10	9	43	34	35	13	18	272

This reveals that only 82 out of 272 cases had a positive sputum; of the 192 negative cases, 52 showed definite reasons for a positive report, nine of these 52 revealed evidence of toxemia, and the other 43 showed cavitation or recent spread on x-ray plates. It is suspected that these 52 cases would show an appreciable error when the sputum is planted on culture media.

In order that medical asepsis may be effective, the sputum must be sufficiently accurate for its character to correlate with the x-ray and clinical records. This would mean that in the testing of sputum for tubercle bacilli we must improve our technique so that any amount of bacilli in a given specimen will produce positive results.

In order that this technique may be efficient, we must produce some means of increasing the number of bacilli in the specimen so that any given sample will be positive. One of the means of doing this is thru the cultivation of the bacilli. The media for the cultivation must be practical and yet must fulfill all the requirements necessary for the successful growth of the tubercle bacilli.

The intention of this paper, as a preliminary report, is to show the need of an improved sputum analysis. The research work, which will be reported on at a later date, will endeavor to produce evidence as to the merit of culturing sputum and whether its use can be of aid to the epidemiologist and the sanatorium.

Upon these three media,—

1. Corper's tissue substrate micro culture with egg yolk,
2. Herrold's nutrient (beef) agar and egg yolk, and
3. Petraganni's potato and egg media,

sputa obtained from the so-called negative cases will be concentrated and then planted. Stained smears will be taken at intervals. The guinea pig inoculation will be used as control.

The framework of effective control of the tuberculous individual from a clinical, epidemiological, and public point of view, will depend upon the success of the development of a technique capable of indentifying minute number of bacilli emitted from an infected source.

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Medical Clinic*

W. W. DUKE, M.D.

Kansas City, Mo.

DR. P. R. SCALLIN: The first case to be presented this morning is a male 21 years of age, white, English, never married. Occupation, farmer.

His father and mother are living and well. He has one brother living and well. None dead. Two sisters living and well. None dead. No cancer, tuberculosis, diabetes or Bright's disease in the family history.

Past History—Abscess under the right arm five years ago after cranking a tractor. He has had measles, chickenpox, flu in 1918, pertussis.

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When he gets warmed up in the hay or harvest field he is troubled very badly. He had a bad attack two weeks ago and was given ephedrine and digestive with restriction of protein diet. He was much better. He has suffered from skin irritations so much in the last few years and has not found relief. He has had this trouble for about twelve years. He first noticed it in the spring when he went into the field to work. He broke out all over like small-pox, but he tells me here that the first thing he notices is usually an eruption about the wrists similar to poison ivy; they are small blisters, and they weep

a little. Any dust seems to irritate the skin, causing itching; shoveling grain of various kinds affect him. He doesn't get this breaking out, but he has intense itching. He seems to get some relief from bathing in salt water.

He has no cough and raises no sputum. There is a little edema when the itching is severe, and that appears in the hands, feet and ears. No dyspnea. No nausea. Appetite is good. No vomiting. Bowels are regular. Urinary tract negative except for frequency after eating sweets. Very seldom has headaches.

General Appearance—Strong and well. Mucous membranes negative; temperature normal; weight 175; height 5 feet 4 inches. Lungs negative. Pulse 72. Tension good. Regularity o. k. Blood pressure 117 systolic. Other findings negative.

DR. W. W. DUKE: The striking point about this case is that at a certain time of the year, along about May, he begins to have an eruption on the exposed parts primarily, and later possibly on his body. It comes out in the form of blisters. It comes out just for a short time in the spring. At other times in the year, as I understand, he will have this eruption badly if he stacks straw or if he is exposed to the dust from wheat. He has cracking between the toes at times. He notices that poison oak affects him.

There are three important things in his case that I get from the history. One is a probable high-grade sensitiveness to poison oak, a probable sensitiveness to *Trichophyton* that grows in the skin, and probably a high-grade sensitiveness to the dust from wheat straw.

Tests should be made especially with poison ivy oil, *Trichophyton* extract and wheat straw and wheat rust.

Let me take up first the poison ivy. People don't have to touch poison ivy leaves to have a poison ivy dermatitis. One of the severest cases I have seen was diagnosed and sent to me as a case of recurring acute pemphigus. Her skin showed great bullae over the legs and arms. We traced the eruption to poison ivy, even though she had never been near poison ivy vines. We thought she was exposed to the oil through petting several dogs which were accustomed to running through the woods. The agent in poison ivy that makes people sick is an oil that is not volatile. Theoretically, we would think that a person could not have poison ivy dermatitis unless they touched the oil. Portions of the plant, however, may break away especially when dry, may be carried in the air. One can actually stay in the house and have poison ivy derma-

titis. We can test for sensitiveness by using about a 1:1000 or stronger extract of poison ivy leaves. Patch tests can be made by applying the extract on a little piece of cotton. Put this on the skin, cover it with adhesive tape, and 24 hours later you will get a little blister in positive cases.

In treating start with an infinitesimal dose, work up the dose at intervals of one week until practical immunity is gained. Complete relief should be obtained.

Poison ivy dermatitis is different for hereditary allergy. People are never sensitive unless they are exposed to poison ivy. For example, it is never found among the Arctic people, but among individuals who live in this country you can count on it that almost all are more or less sensitive to it, and if exposure is adequate they will react to it.

We can sensitize artificially to poison ivy extract by exposing the skin to a little bit of it. The person may not react to the first dose, but will react after an interval of one month or more. That can then be cured by poison ivy treatment. It is one of the most favorable types for treatment.

The dust from straw affects this man. I have had patients who were sensitive to the dust from corn shuck and gave positive tests to an extract from the corn silk or corn shuck, but negative tests to corn grain extracts and to corn pollen extracts and to corn fungus extracts, so-called corn smut. Cooke reported observations on a case similar, caused by the straw of timothy. His case was not sensitive to timothy pollen and did not have trouble coinciding with the pollen season. This patient gives a negative test to wheat protein but should be tested with straw extract.

As to the *Trichophyton*, sensitiveness—this fungus infection is very common and is a frequent cause of skin disease. A common manifestation is cracking or sweating between the toes. This *Trichophyton* exists in the normal skin, and under certain conditions it becomes more active and causes tiny blisters. A common site of occurrence of the rash is along the inside of the fingers. It can make great blisters over a considerable area of the body. A case of that sort gives a positive patch test to a *Trichophyton* extract. The fungus can be isolated and grown and you can put the growth on the skin, cover it with cotton and a piece of adhesive, and leave it on 24 to 48 hours. When this is removed you find a series of blisters or eczematous rash. A *Trichophyton* infection of this sort can sensitize

an individual and these often cause true manifestations of allergy.

I would guess that this boy is sensitive to poison ivy that he gets in May and thereafter reacts to emanations from the dust from the straw of wheat, and to *Trichophyton*. Whether or not he is sensitive to additional agents it is difficult to say. Certainly these tests made with all the cereals are flatly negative.

DR. C. A. WILLIAMS: This patient is a woman aged 37. Two children living and healthy. Father had asthma, especially affected by dust. Sister had hay-fever when she lived in the woods of Wisconsin. She did not have it here or in Montana.

Personal History—In the fall of 1924 she had a slight attack of asthma. September 15, 1925, she had a more severe attack. A test on the skin made at that time showed positive to feathers, especially goose and duck, also positive to dog and cat; slightly positive to ragweed, wormwood and lamb-quarters. July 24, 1926, she had a mild attack. September 7 she had a more severe attack. October 25 she made a trip to the Mayo Clinic. I might mention that when she took a trip some place else the asthma always disappeared. In 1927 she had a fairly good year. That was a wet year out in that country. In 1928 it wasn't very bad. In 1929 she was very bad, but while she was away from home she felt fine. She spent a week down at Marion, South Dakota, and said she felt fine. In 1930 she lived in Aberdeen for one week during her worst attack and felt good. On her return she had a severe attack lasting about two weeks. She had treatments during 1930. In 1931, from July to November, she had a severe attack. During the last two years she has had some treatments, possibly pollen treatments.

Dust, swatting flies, and weeds, after an attack once starts, affect her by a sensation of tightening in her throat.

During the fall season she has practically no sneezing, perhaps once or twice a day, and absolutely no itching of the nose or throat or redness of the eyes.

DR. DUKE: The history of this case is very interesting. I may say that you can't expect much from her skin tests offhand. This case at the present time is not likely to show positive skin tests.

There are several important facts in the history of her case. One is that her trouble started in the latter part of September and disappeared with cold weather. Another is that locality af-

fected her. Another is that dust, even the dust stirred up by a kitten walking across the floor, would give her symptoms of an attack of asthma. The swatting of flies affects her, and she says that she can smell a swatted fly.

Pollen asthma starts in the latter part of September. It doesn't start in the latter part of August when pollen hay-fever starts. That has been commented on. Whereas most physicians admit that they do not know the cause for this, I think I can explain it. Pollen asthma is not easily brought on by pollen. It takes a lot of pollen and a long exposure to get it started. I think the changeable weather that occurs in the latter part of September is the agent that precipitates pollen asthma, that is, there is a heat and cold sensitiveness, in addition to pollen sensitiveness, that causes the majority of cases of pollen asthma to start.

She gets along better in wet areas than in dry. That, as a rule, is the reverse. She ought to be carefully tested with heat and cold.

House flies in relation to her trouble should be caused by direct contact with the flies. In the case of flies of the moth and butterfly group, however, scales break off the wings which can sensitize individuals and thereafter cause hay-fever or asthma.

On certain days you will find myriads of little grey flies on the lawns. These furnish myriads of scales. Panlatto has found as many scales in the air at certain seasons as pollen granules. They can sensitize a person in exactly the same way that pollen does, and cause hay-fever and asthma and dermatitis.

A house-fly has no scales. It is strange that she should react to them unless she comes in direct contact with them.

We have now tested her with all the pollens and we do not get any positives. These are group tests. The first is with a group of animal hairs, and the second with a mixture of flies. I have four different kinds of flies, for testing but are all flies of the moth and butterfly type. I have no house-fly extract. We have here tests with dust and feathers and we don't get a frank, positive test with any of them. These little red lines on her arm do not mean a great deal.

From her history of being made ill by so little dust we could almost be assured she would give us a positive skin test to dust if we could get the extract taken from her own house dust. In this case we could cure her of her own dust sensitiveness. It is very mysterious how dust in a certain house will give a person asthma. It is not the dust that is tracked in from the

street that counts. The dust that is important is the dust that accumulates slowly in the house. Hopkins found a fungus responsible for one dust case. Dust for testing and treatment should be collected from curtains, bedding, under beds, etc. Dust can be collected by placing a piece of cloth in the big collecting tube that goes into the vacuum cleaner. The cleaner should then be run around in dark corners, under beds, over mattresses, over pillows, in the cracks between the layers of upholstery in the chairs. In other words try to pick up dust that has been in the house for a long time. This can be extracted and used for testing. If you get a mildly positive test the extract can be used in treatment. You can nearly count on relieving a person with this history of dust asthma if a positive dust test can be obtained.

I would say to her that probably dust and flies, heat and cold, and possibly pollen (I am not sure about the pollen), are the important factors so far as we can determine by the history.

I am going to drift from the field of allergy for a minute and show a very interesting case that Dr. Hammond has here.

DR. M. J. HAMMOND: This man is a young farmer. He is 46. Nationality, German. He has been living near Watertown for 20 years. He is a single man and lives with his brothers and sisters. His father and mother are dead.

The family history is rather negative. He came to the clinic June 6. He gave the following history: He has had measles, whooping cough, flu, mumps, chicken-pox and pneumonia. Two or three years ago he had sinus trouble and had an operation for it. For about two years he has not felt well. At times he would feel pretty good, and then sometimes he wouldn't. His sisters noticed this perhaps more than he did. He would feel pretty good and do his work the same as usual, but sometimes he would notice small bunches of kernels, as he said, along the sides of the neck and in the axillae and groins; sometimes they were larger than at other times, and then would almost disappear, but would come back. He had quite a severe attack of flu last January and has not felt well since, but he has been working all the time.

When this man came into the office he had been cultivating potatoes in the forenoon and said he was so weak that he had to quit work. Now he is tired out, his appetite is gone, he feels weak, he is very pale, short of breath on exertion, and for a few days he has had slight pain in the heart region; otherwise he has had no pain. He has a dry, hacking cough; no sputum.

The findings are, as you see; he is very anemic, a rather slight yellowish tinge to the skin and whites of the eyes. Lungs: The x-ray shows some enlargement of the mediastinal glands. The pulse rate is 108. The blood pressure is around 110 to 120. There is some distention of the abdomen, some enlargement of the liver. The spleen was palpated pretty well down in the abdomen. The kidneys were not palpable; some general tenderness. The tonsils have been removed. The teeth are fair; some pyorrhea. Fluoroscopic examination shows the liver enlarged and the spleen very much so at this time.

Blood examination: hemoglobin 30; red blood cells 2,200,000; white blood cells, first count, 165,000. The stained slide and count was made just of the lymphocytes because they were so predominant. It was close to 99 per cent, and mostly small type. The cervical, axillary and inguinal glands were enlarged. The blood platelets were very noticeable for their scarcity. There were very few platelets. The white cell count day before yesterday following a transfusion had dropped to 110,000. He says he feels better since that time.

DR. DUKE: This patient of Dr. Hammond's is a textbook example of chronic lymphocytic leukemia. This, however, is not the common type of lymphocytic leukemia. The common type is different, and as a rule it is overlooked in medical diagnosis. A patient brought in with leukemia, either splenomyelogenous or lymphocytic, is rarely brought at the beginning of the trouble; he is brought in as a rule far along in the course of the disease. It just happens by accident that I have seen two cases in their incipency. That is a most unusual experience.

This chap gives a history of his trouble dating back as a matter of fact, only a few months, but he has noticed the large glands for two years, and they may have been there unnoticed four years ago. The patient does not come to the doctor until he is so full of lymphocytes that they begin to cause weakness. This is commonly in the first symptom.

We find glands here the size of good-sized beans. The subpectoral glands are as large as a good-sized bean, and the glands in the axilla and groin are quite large. His spleen comes down to a little below the level of the umbilicus, and his liver to about four fingers' breadth below the costal margin. He has a very loud hemic heart murmur, and, as you see, he is pale.

I want to say one word about anemia in general. Don't look at the conjunctiva or the lips or the nails for a diagnosis of anemia. Look at

the palm of the hand. That fellow may be pale, but he is not noticeably pale. But look at the palm of his hand. That is the most accurate way of diagnosing anemia. You can spot a grade of anemia that does not amount to more than a few hundred cc. of blood in that way. If your hand is normal in color, put it at the apex of your heart and put the patient's palm at the apex of his heart and compare the color of the two. If your hand is normal in color you can detect a loss of 100 cc. of blood in the patient.

The high lymphocyte count is classical of the disease, but not the common finding. I think over half the cases of leukemia that I have seen in a lifetime, have not had a high white count at all; they run between 3,000 or 4,000. They also may not have enlarged lymph glands. They often have lymphomata on the skin, a thing which this man does not have. You may find accumulations of lymphocytes here, there and elsewhere in the skin tissue, which upon section prove to be lymphomas.

I saw a case diagnosed multiple sarcoma once which was nothing more than a case of lymphocytic leukemia with a low white count. They also may have a tremendous reduction in the number of polymorphonuclear leukocytes and the platelets. Lymphocytes may accumulate in the marrow and grow until they actually crowd out the normal blood forming elements, which make the red cells, the platelets and the leucocytes. A case of that sort will complain of a little weakness, but the thing that brings him to the doctor is not always symptoms that the doctor diagnoses as leukemia, but symptoms either due to a lack of polymorphonuclear leukocytes or a lack of the platelets. When a patient has no polymorphonuclear leukocytes, any infection he gets will tear him to pieces. We see in the old textbook descriptions of leukemia, descriptions of these frightful cases of angina of the throat, never once attributed, however, to a lack of polymorphonuclear leukocytes. When they get infection in the gums it causes very destructive pyorrhea.

Another symptom which brings the patient to a doctor is a haemorrhagic disease caused by a lack of blood platelets. I found that if the blood platelet count is as low as 30,000 from its normal of 250,000 to 400,000, a person bleeds for a long time from needle pricks, and if it was reduced to 10,000 he displays spontaneous hemorrhages from the bladder, the alimentary tract, the nose or gums or what-not, and if it gets below 10,000 he bleeds frightfully so that the effect is terrible and may prove rapidly fatal.

I have known of cases that bled all night from a needle prick.

These symptoms often bring the leukemia case to a doctor for the first time. The white count may run between 6,000 and 12,000 or 15,000 with a tremendous predominance of lymphocytes. The blood in this man shows about 99 per cent small lymphocytes and a lack of platelets and a lack of polymorphonuclear neutrophils.

The treatment for this man is X-ray applied correctly. You have to be very careful about X-ray or you may have a bad effect from it. I have found that the best way to apply it is not on the spleen and liver, but through the chest. A large proportion of the blood of the entire body is in the chest, in the lung vessels, the heart, aorta, vena cava, etc., and you can treat the blood with X-ray very, very effectively by exposing from the neck to about the abdomen with a half to three-quarters of an erythema dose of X-ray front and back. I wouldn't give more than the front one day and the back perhaps three or four days later. Then watch the white count. In the anemia patient stop when the count is reduced to 20,000 or 30,000, because if you push it beyond this you are liable to get something you do not want.

This man needs between two and three pints of blood, given by transfusion. This ought to be done right away. He will look like a man raised from the grave if you give him this adequately. He will get strong and walk around. White cells, 150,000, are not so harmful as you might think, if he had enough red cells. He could probably walk around and look like a fairly normal person. Arsenic is good for leukemia combined with X-ray and transfusion. He ought to be gotten back into fair shape and keep going for quite a period. Transfusions ought to be pushed until the palm of his hand is the color of the normal hand. That is the index of an adequate supply of red cells.

DR. COTAM: Does a positive Wassermann make any difference in a case like that?

DR. DUKE: An allergy case does beautifully under anti-specific treatment. An unfortunate thing about the combination of the two is that they cannot take salvarsan very long. They get sensitized to it, so after anywhere from three or four to a dozen doses of salvarsan they begin reacting, and the chances are you have to stop using it, but if you go on with mercury and iodid they get well. They have an immunity to both syphilis and tuberculosis that is not enjoyed by the average person. It is not complete however. I have had one case in all my experience

that died of tuberculosis that had real allergy. They get well if you give them half a chance.

DR. WILLIAM DUNCAN: This little boy had his first asthmatic attack Saturday morning. His past history is negative except for the fact that all spring he has been having frequent colds. With his last cold about a month ago the mother noticed that he wheezed a little, but he did not have any real respiratory difficulty. In the family history there is no allergic disease except the paternal grandmother has difficult breathing when she has a cold.

This boy had a cold about the middle of last week and then on Saturday morning at four o'clock he developed severe difficulty in breathing, with cyanosis, and he seemed to be a very sick little boy. When he was examined he was found to be cyanosed and he had extreme difficulty in breathing, especially on expiration. The chest examination showed the typical asthmatic rales, and he was relieved with adrenalin, but not completely. The attack lasted during the day, and that evening after a little more adrenalin it cleared up and he has been fairly well since.

This next patient, a man, entered the hospital Saturday night with an acute attack of asthma which has lasted for the most part of three weeks.

Past History—He is 36 years old. He had his first attack of asthma at the age of five, following severe whooping cough and measles combined. He has attacks approximately once a year; they are prolonged and he gets relief from adrenalin sometimes, but this time adrenalin did not have much effect. I notice he still has respiratory difficulty. He still has typical findings in his chest. He has been quite a traveler and has been to many famous clinics throughout the United States.

DR. DUKE: It may sound strange, but if this case of asthma could be studied (it might take a week or two weeks to work it out, maybe a month), he could be from 75 to 90 per cent relieved of his asthma through thorough allergic study. It is not a case that we will be able to diagnose by skin tests. One statement the patient makes is interesting, if true, that is that rat hair will cause him to have asthma. I have never seen a rat hair case. Another interesting feature of his case is that he says the only thing that he knows of that precipitates an attack is sudden excitement. This is probably a manifestation of heat and effort sensitiveness. There are patients who have asthma under the influence of heat. These same people as a rule are sensitive to the effect of mental or physical effort. They are as a rule more sensitive to

one of those two agencies than the other two. If this is a mental effort case, the attack can probably be stopped more readily by ice. Heat and effort will have to be avoided until he gains tolerance for them.

If you wish to give adrenalin to a patient of this sort give it in a way that it will do him good and no harm. Start by putting a tourniquet around the arm: that stops the absorption of the adrenalin. Then do not give a great quantity. I would say a maximum of 0.25 cc., that is a quarter of a cc., is as much as we ever use in our office. I never have to use over 2 cc., in 24 hours, in spite of the fact that many cases are sent to me taking two to three ounces a day. After you have placed your tourniquet, inject your adrenalin distal to the tourniquet and leave the tourniquet in place. It always bleeds. It may make you think you have put the adrenalin in a vein. The fact is that you break a thousand capillaries when injecting the needle, and the increased capillary pressure makes it bleed. If you should get the adrenalin in a vein the tourniquet will hold the adrenalin where it is until it constricts the vein. When you take the tourniquet off, the patient will not have a noteworthy adrenalin reaction: such as extrasystoles palor and tremor. You need never have a marked adrenalin reaction if you use the tourniquet. It does not stop the flow of blood, but does stop the absorption of adrenalin. After the vessels are constricted take the tourniquet off, and if slight adrenalin tremors appear reapply the tourniquet quickly.

Pollen extract ought to be mixed with ephedrine and adrenalin both, and given in this way, because you want to hold your pollen locally and then you won't get a reaction. Leave the tourniquet on long enough for the adrenalin to cut off the venous supply to the pollen or to the adrenalin itself, and after that absorption is smooth. Adrenalin given in this way is a smooth administration of the drug; it is absorbed by degrees. You do not knock the patients off their feet by a too rapid rate of absorption.

After removal of the tourniquet wait for ten minutes. If the person is not better, give more adrenalin. Then wait another ten minutes and give more. Give it until the person has a feeling of relief. If you put in a cc. at first and that is too much, it is going to stay there. But if you start with a tenth of a cc., as in the ordinary case, and repeat it until you get what you want, you are not going to have any of these frightful overdoses that are so bad for a person. The asthma cases that I find in desperate shape have

often been as sick from adrenalin overdose as from asthma.

We have no positive test for animal hair in this patient and since we have given him the adrenalin we probably won't get one.

He has had enough adrenalin. You can see the adrenalin tremor in his hand. Since this man has a tremor of the hands and he feels tremor himself, there is no use forcing adrenalin beyond this point. You have to use other means of stopping this asthma if this does not relieve him.

You see the white area from the adrenalin blanching. That shows you that the adrenalin is being absorbed from now on very slowly. If we had pollen mixed with it the pollen would be absorbed very slowly also.

A case of this sort requires study, and I wish to tell you that it takes study and experience to succeed with him. If he could be worked over for two or three or four weeks carefully, the cause for his trouble probably would be found and he probably could be grossly relieved.

The child with the history that the doctor gave is just at the point where he can pick up pollen or hair sensitiveness. We very seldom see sensitiveness to inhalant substances in infants. Also children below four, almost never give positive skin tests. They have not developed their immune bodies by that time. Allergy in an infant can usually be traced to something the child or the mother is eating. It is just as likely to be the mother's food as the child's. If the child is egg sensitive and on an egg-free diet and if the mother eats eggs and kisses the child or handles it, the child may have asthma in just the same degree as if he had eaten eggs himself. A food carrier is just as important in the etiology of asthma in children as a typhoid carrier in the epidemiology of typhoid fever.

To cure a little infant sensitive to milk, eggs, or wheat, with symptoms such as asthma or eczema or hives, you have to get the milk, eggs, cereal, or what-not, out of the house and make the parents quit eating and handling it. Then you will get relief if your diagnosis is correct.

DR. COOK: How about honey in urticaria cases?

DR. DUKE: I have seen a dozen honey cases, and they are the most highly sensitive cases that we have. If a honey case eats a drop of honey it is too bad for the patient. They can be sensitive to the flower that the honey comes from, or to the bee. They will react to certain types of honey and not to others. It can cause any-

thing—asthma, hay-fever, hives. Honey always gives positive skin tests in positive cases.

DR. COOK: I thought perhaps this patient had been stung by a bee.

DR. DUKE: If a bee stings a person who is sensitive to bees it is too bad. I have known of several cases in which death resulted as a result of an insect sting. I have known of two doctors who were sensitive to bees, and one or two stings would give them a terrific illness that would be all but fatal.

DR. J. B. VAUGHN: This is a girl 25 years old. Family history: No chronic diseases and no family history of the present condition.

Past History—Diseases of childhood, measles, chicken-pox, whooping cough.

History of Present Trouble—January, 1931, had spells of burning and itching; skin became red and wheals formed. Tomatoes and strawberries are the greatest aggravation. Also when she becomes excited this increases the trouble. Likewise two days prior to menstruation.

Urticaria seems to be more marked on the abdomen. Respiration system negative, circulatory system negative, gastrointestinal tract negative, menstruation regular, no severe headaches.

DR. DUKE: You have never had hay-fever or asthma?

PATIENT: No.

DR. DUKE: Headaches?

PATIENT: No.

DR. DUKE: Dizziness?

PATIENT: Yes.

DR. DUKE: How often?

PATIENT: Not so often.

DR. DUKE: Is it severe when you do have it?

PATIENT: No.

DR. DUKE: Do you have any attacks of nausea or vomiting or diarrhea?

PATIENT: No.

DR. DUKE: Any bladder trouble, painful or frequent urination?

PATIENT: No.

DR. DUKE: Any eczema?

PATIENT: No.

DR. DUKE: How often do you have the attacks if you don't eat strawberries or tomatoes?

PATIENT: I have them with nervous excitement or something of that sort.

DR. DUKE: How does heat affect you?

PATIENT: It bothers me quite a lot.

DR. DUKE: If you run does that bring it on?

PATIENT: Yes.

DR. DUKE: If you get chilly does that relieve it?

PATIENT: Yes.

DR. DUKE: As a rule in a case with this history we usually find a food or heat and effort or cold sensitiveness. She finds that tomatoes and strawberries bring out her rash. She might find other foods do the same. Skin tests are almost useless in this type of case. They may be sensitive to food and not react cutaneously, and vice versa. This is one unfortunate thing about food allergy. I think the reason is that they don't react to food as it exists in nature and as we have it in test solutions, but they react to a split product of the food after it is split down by the gastric and pancreatic juice and has been absorbed.

The history is very illuminating. Dietary tests help. Put her on some gross elimination diets that eliminate a quantity of foods, eliminate one group after another, and you can get useful information.

She says when she gets hot she has trouble; if she exerts herself too much she has trouble. I have no doubt that we could devise a means of bringing out her allergy through the agency of heat and effort and we could stop it with cold, and that we could treat her accordingly and get a gratifying therapeutic result. Such a person can get along very nicely in a dry place like Colorado or up North, but if they are in a wet climate, whether it is hot or cold, they have trouble. You can get heated up in winter just as you can get heated up in summer; in fact, you can have more of a change from cold to heat in the winter than in the summer. Some of our heat and effort cases do most of their reacting in the winter. They go out and get chilled, and when they come into a warm room and get heated up they have urticaria, headache, dizziness, Meniere's syndrome, irritable bladder, gastrointestinal symptoms, diarrhea, etc. It can affect any organ to which the sympathetic nervous system goes, and that means practically every active tissue we have in the body. We have brain allergy characterized by peculiarities of behavior, sometimes convulsions, loss of consciousness, sometimes paralysis in one part of the body one day and another part the next, areas of anesthesia that move around, hives, angioneurotic edema inside the skull. In the internal ear allergy can cause disturbances of hearing, which is rare, and can cause the most terrific attacks of Meniere's

syndrome that I have ever seen.

PRESIDENT BATES: Did you ever have a case of urticaria from picric acid?

DR. DUKE: Sensitiveness to picric acid is very common.

I wonder if anyone here would mind telling us about some of their peculiar cases.

DR. H. W. SHERWOOD: How often do you run across sensitiveness to quinine?

DR. DUKE: That is one of the common drug allergies.

DR. SHERWOOD: I had a man who took one dose of bromoquinine and he became all broken out, he couldn't breathe, I couldn't feel his pulse and couldn't hear his heart.

DR. DUKE: We have another patient here who has no hives, no headache, no hay-fever, no nausea or vomiting. He just has asthma. This is a very interesting case. He gives a history of having had asthma dating back about twelve years, and it occurs chiefly in the winter, but it can occur in the summer. It starts in November. In a case of that sort we can almost eliminate the pollens, we can more or less eliminate the foods, because a food case ought to be somewhat perennial. We find in questioning him that sweet clover hay dust gives him asthma immediately. He is a farmer and is in and out of the barn constantly. He tries to keep out of the barn. He is sure that hay gives him asthma. He says cold gives him asthma. That would have to be worked on carefully. It is important to know whether it is cold on the skin or the breathing of cold air that affects him. That ought to be tested for objectively to find out if he is a heat and cold case in addition to being a hay dust case. The hay dust that makes him sick ought to be collected out of his barn and extracted, and he ought to be treated with it regardless of what the skin test may show. This seems to be seasonal, but he may have it a little bit at other times. Such people who have allergy dating back twelve years, especially if it is perennial, develop polyps in the nose, and finally they get infection in the nose.

This fellow has a lot of abscessed teeth. I do not think it has been proven, in the case of chronic infections of the tonsils and teeth, that this is an item. I have had infections cleaned up to relieve asthma and hay-fever, and I don't think I have gotten very far this way.

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THE MEDICAL CARE OF THE VETERAN

Those connected with the medical care of the veteran in the immediate post-war days will readily recall the train of events which led to the present state of affairs.

A close study of this train of events should convince us that we of the medical profession, because of our indifference at that time, are to some degree responsible for this situation.

In those days the care of the veteran to a limited extent was in the hands of the family physician. An organized effort on the part of the physician at that time perhaps could have retained this work where it justly belongs.

The work of over-zealous American Legion employees and full time Veterans Bureau men, coupled with the indifferent attitude of the general medical profession, fostered a gradual evolution of a system not even dreamed of by the promoters themselves.

All have been willing and anxious to do all possible for the deserving veteran who was disabled because of war injuries or exposures. Large numbers who had no disability or disability of non-service connection took advantage of this fact and through relatives, friends, American Legion officers, and politicians, demanded the same service accorded the really disabled service connected veteran.

No man but the medical man was in a position to determine the validity of the various claims, yet through the above mentioned agents the claims of the undeserving were forced upon the government, and legislation enacted until now the way is open to an unlimited number of un-

deserving applicants and the expense to the government has become unbearable.

To be sure the American Legion has done marvelous work for the veteran, but had the work in this line been directed by the medical profession, no such unreasonable limits as exist today could have been reached.

The more they secured for the veteran the more secure were the positions of the ambitious leaders of the American Legion.

In the prosperous post-war period the appeal struck a sympathetic cord and one demand after another was allowed to go by uncurbed until the final act (1930) of permitting every man who ever wore a uniform to be taken care of at the government's expense was passed.

Dr. Dublin of the medical advisory board of the Veterans Bureau made a statement that if this was carried out to the letter it would cost the government so many billions of dollars that it cannot be estimated.

The members of the American Legion and politicians who were primarily responsible for this act knew little what the outcome of this legislation would be.

When the American Legion began this campaign the only persons who could comprehend what this would lead to were the medical men. There were 35,000 medical men who were veterans themselves. Instead of remaining in the American Legion and attempting to direct or curb this legislation the great majority, dissatisfied with the conduct of affairs, withdrew from the organization and allowed the laymen to control the medical care of the veteran.

Had the medical profession become properly organized to care for the veteran in the private hospital under the direction of the family physician, this unwarranted expense of constructing government hospitals could have been curtailed and the problem before us now would have been comparatively easy to solve.

A new administration is soon to take up the responsibility of the nation. They must curtail government expense. Already many of our prominent medical men are hard at work attempting to undo the wrong that has been done. They must have active co-operation of every medical practitioner in order to bring back the control of the medical care of the veteran to the medical profession.

There must soon be new legislation to remedy this situation. The present government hospitals cannot take care of the needy under this program. The government does not have the money to construct more.

We failed to retain the veteran at home in the private hospitals under the care of the family physician when we had a chance. We will fail again unless we have a definite program. It is up to the medical profession to work out this definite program. This must include a fee schedule and all other items demanded by those who have had charge of the medical care of the veterans for the past years.

The fact that we failed before to retain control will make it doubly hard for us to again get control of this very important situation.

The American Legion and those in charge of the Veterans Bureau do not believe the medical care of the veterans can be properly handled by the private hospitals and the private physicians.

If we are not interested for our own sakes let us at least make an attempt to clear the way for those who are to succeed us, and show the present authorities that we can solve this problem to the satisfaction of all concerned.

J. M. H.

LIVING THE PART

Confidence in one's physician is of such vital importance that every proper effort should be made by members of the profession to deserve, secure and maintain it.

The maintenance of a certain professional dignity serves to inspire confidence and respect which has its intrinsic value in every relationship of trust. There is an inborn impression that there is something supernatural about the healing art and it attaches itself inferentially to those who represent that high calling.

Impressions are anything but trifles. Their usefulness must be borne in mind and their other effects never underestimated. They may serve as constructive or destructive forces and in this personal conduct becomes an emissary of great moment.

We recall the instance of a patient who did not believe he had received first aid from a

regular physician because he had overheard others calling him "Bill"; even another physician (who should have known better) addressed him as "Bill" and this to the patient was conclusive disavowal of any professional attainment or rank.

We believe that the profession might benefit by a few de-Babbitizing inoculations along this line. It would help to correct some of the evils that have attached themselves and are now being complained of. Intimate names are for intimate persons and places and should be avoided in mixed company. Don't *abandon* the uses of this honorable title of doctor to the eager cultists. Some of the little niceties that may seem inconsequential, are really quite important. Maintain a professional attitude, especially in public. Dress, live, act and conduct yourself in a way that shall lend honor to a noble profession, and redound to your own credit and increased usefulness.

A. E. H.

WHO SHALL PRESCRIBE DIETS

The present popularity of the dietetic treatment of disease is affording great delight and convenience to the faddist, cultist and would-be-doctor. Another way has been found to practice medicine without the prerequisite of a license, or danger of state supervision of any kind; a useful discovery of the benefit of the alert but evasive pretender to the scholastic requirements of the healing art.

Physical directors and their enthusiastic followers have hit particularly upon that brand of diet known as roughage and dispense it to attentive listeners and devoted followers with unrelenting and indiscriminate assiduity. The immediate result of such preachment and sandpaper method of stimulating the intestinal mucous membrane repulsion is increased peristalsis, of course. Continued pursuance of this nefarious sophistry and egregious practice, however, gives rise to irritation, intolerance and a resultant spastic colon constipation of a far more difficult nature to combat than the original sluggishness which it was intended to overcome.

Although chronic constipation is best treated by diet, the unfortunate train of symptoms so often seen would seem to emphasize the fact that it is not acquaintance with mechanical stimulation diet alone that is necessary but a complete knowledge of the complexities of the whole problem. This may only be presumed to repose in the scientifically trained physician who alone should be accorded the prerogative of prescribing diets of any kind.

A. E. H.

Proceedings Minnesota Academy of Medicine

Meeting of November 9, 1932.

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 9, 1932. Dinner was served at 7 P. M. and the meeting was called to order at 8 P. M. by the president, Dr. J. C. Litzenberg.

There were 38 members present.

Minutes of the October meeting were read and approved.

There was no business meeting and the scientific program was as follows:

DR. A. E. WILCOX, Minneapolis, gave the following report of "A Case of Ruptured Kidney."

The patient was a female, age 26, who was injured in an automobile accident October 30, 1932. She was thrown through the windshield of the automobile in which she was riding when the car struck a tree stump. The patient was not completely unconscious but was dazed and in traumatic shock when she was observed immediately upon being admitted to the General Hospital Emergency Department. The following day she was transferred to Asbury Hospital, at which time she was suffering from lacerations of the head and face and general body contusions most marked on the left side. She also complained of severe pain in the left lower thoracic region and adjacent lumbar and abdominal areas.

In addition to the lacerations, the positive findings upon admission were marked tenderness and rigidity in the left loin and left upper and middle portions of the abdomen. The blood pressure was noted to be 100/40, and temperature 102°. The following morning her temperature was 100.2° and she seemed better. However, the urine showed 3+ albumin and many red blood cells. The hemoglobin was 71 per cent, erythrocytes 2,500,000 and leucocytes 22,200.

Forty-eight hours later, following a severe chill, the patient's temperature rose rapidly to 106.3°. She was given morphin and 3000 cc. of salt solution by hyperdermoclysis, and the temperature dropped to 99.6°.

A flat plate of the abdomen was made which showed a diffuse shadow on the left side obscuring the left psoas muscle; the right, in comparison, being quite clear. A few red blood cells persisted in the urine and the local symptoms of pain, tenderness and rigidity became more marked in the left upper abdominal quadrant and through the lumbar region.

Cystoscopic examination showed normal urine from the right side, and no secretion from the left. The left urethral opening was reddened and swollen and the mucous membrane around the opening was markedly injected and some exudate was present.

Following the cystoscopic examination the left loin was explored under spinal anesthesia. The usual curved kidney incision was made and, upon reaching the perirenal tissues, results of marked and diffuse hemorrhage were noted. The retroperitoneal space was filled from the diaphragm down to the pelvis with coagulated blood, and when the kidney was isolated free bleeding from the parenchyma was observed. The pedicle of the kidney was rapidly isolated and clamped en masse and the kidney removed.

Examination of the specimen presented shows a rupture of the lower pole and complete tearing and division of the ureteropelvic junction. The upper end of the lower portion of the ureter was not located.

Appropriate drainage was instituted and the wound was closed with through-and-through sutures. Immediately following the operation, 500 cc. of blood was obtained from matched donors and transfusion by the citrate method instituted. A reaction with temperature of 103.8° ensued, following by gradual recession. On the fifth postoperative day the temperature was 100.2°, pulse 104. The patient's general condition is good at the time of this report.

(Subsequent note: The patient left the hospital Dec. 1st, with the wound still draining, but condition much improved.)

DISCUSSION

DR. OSCAR OWRE, Minneapolis: We encounter quite a number of these injured kidneys at the General Hospital and often the patient is in such a critical condition that cystoscopic examination cannot be performed. In these cases the intravenous administration of Skiodan assists us in making a very early diagnosis. Sometimes if the ureter is badly injured or completely severed, the urine after a short time becomes clear owing to the fact that the urine is being secreted into the tissues outside of the kidney and not into the bladder. Then if we measure the amount of urine passed it will be found to be approximately one half of the usual total with a palpable tumor mass in the loin of the injured side which increases in size and is painful on palpation. Here again the dye will be seen on X-ray films to be passing into the tissues outside the kidney.

DR. C. N. HENSEL, St. Paul, read his Inaugural Thesis entitled "Pitfalls in Cardiac Diagnosis." Lantern slides and charts were shown.

DISCUSSION

DR. H. L. ULRICH, Minneapolis: I wish to congratulate Dr. Hensel on his fine review of the problems of the cardiopath. Fifty per cent of the patients who come to us complaining of heart symptoms have no heart disease whatever. One of the simple rules of procedure in cases where there is true valvular defect is: If there is no response to rest and digitalis, there is some complication superimposed on the situation. In valvular defects, particularly mitral disease, one of the most common complications of this nature is hyperthyroidism. Hypothyroidism is encountered sometimes but it is not so prevalent. We have been able after years of experience to quite accurately diagnose the thyroid heart--the heart which is whipped up by a high metabolic rate. There are, however, instances in this group of certain cases that come to us in a decompensated state in which the hyperthyroid disease is overlooked and these go on to exitus in spite of our attempts at therapy. I have seen instances in which hyperthyroidism was even suspected and Lugol's administered without success. At post-mortem nothing was found in the heart except some hypertrophy. The thyroid, however, showed hyperplasia or adenoma. One ought to examine the thyroid more closely in cases where there is no response to therapy, and surgery should be gravely considered in spite of the decompensation.

In the group that have valvular defect with hyperthyroidism, the differentiation is not so clear in the minds of clinicians. A goodly number are what we call the larval type. There is no other evidence of hyperthyroidism, the only evidence being a heart which may exhibit total irregularity or a rapid regular rate and in which there is no response to the usual therapy. Quite commonly there is no associated increased metabolic rate. Here careful palpation of the thyroid is indicated. One can often detect adenoma. That type of case is also a surgical problem.

The other point which Dr. Hensel made, the psychoneurotic, is a clinical problem which can only be handled by experience. Of course there are other pitfalls in the diagnosis of heart disease; I mean real heart disease, which he has not touched upon. But we are not discussing these because they are only of academic interest.

DR. C. N. SPRATT, Minneapolis, showed moving pictures of (a) Cataract Extraction (pocket flap method); (b) Glaucoma Sclerecto-Iridodialysis; (c) Enucleation with Fat Implant; and (d) Magnet Operations.

DISCUSSION

DR. SPRATT: Dr. Brown suggested the possibility of tearing the conjunctival flap. Old people, especially those reduced in weight, may have a fragile conjunctiva. The use of the blunt forcep rather than a mouth tooth, and a round needle rather than the ordinary cutting needle, will obviate this difficulty. Should the conjunctiva be torn, enough of the flap remains to secure a strong wound. Certainly a much firmer and better apposition can be secured than by the ordinary incision made in the cornea or limbus.

It is not difficult to do this operation although it seems so from looking at the pictures. The knife is inserted in the pocket, the flap is turned up and there is perfect visibility in making counter puncture. My object in doing this operation with this flap is that the factor of safety is tremendously increased by the suture of the conjunctiva. The possibility of infection is reduced and the period of convalescence is shortened. Very few patients are kept in bed over twenty-four hours and most of them leave the hospital inside of a week.

There is slightly more bleeding with this type of operation but, due to the fact that the posterior capsule is in place, this blood is confined in the anterior chamber and is soon absorbed.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

Proceedings Minneapolis Clinical Club

THE regular monthly meeting of the Minneapolis Clinical Club was held on Thursday evening, November 10, 1932, in the Lounge of the Medical Arts Building.

The meeting was called to order by Dr. Archie H. Beard, president, and the following scientific program was given following a short business meeting:

Dr. A. E. Cardle read his inaugural dissertation, "Intramuscular Liver Extract in the Treatment of Pernicious Anemia." Dr. Walter H. Fink gave his inaugural dissertation "The Slit-Lamp in Medical Diagnosis."

INTRAMUSCULAR LIVER EXTRACT IN THE TREATMENT OF PERNICIOUS ANEMIA

SUMMARY

- (1) Of the injectable extracts the intramuscular route appears to be the most satisfactory.
- (2) Forty cases under treatment with this extract have shown excellent results.
- (3) Certain types of cases are described which appear to be particularly adapted to this type of treatment.
- (4) Dosage is individual, but the optimum dose is deemed to be the best.

DR. BEARD: Have there been any reports on the use of fish liver in the treatment of pernicious anemia? When I was in Oslo three years ago an attempt was being made to use the liver of codfish. The expense of course would be a great deal less than it is at the present time.

I am following six cases of pernicious anemia. If these patients are not consistent in their treatments, the results are not satisfactory. If they allow the period between their treatments to be from three to four weeks the response is very poor. I have found that the period between injections should not be over ten days.

Since the introduction of liver therapy transfusions have not been used as frequently as formerly. In those cases in which the red blood count is not below 1,000,000 a transfusion certainly is not indicated. When the red blood count is below 1,000,000 it possibly might be necessary. However, I think liver therapy should be instituted first, and if there is not the proper response a transfusion might be used later. The severe reactions following transfusions are apt to occur among those with a very low hemoglobin and red blood count, and for that reason they fall in this class. Personally I am very much against transfusions except as a method to use in last resort when every other medication has failed. In the old days during the gastric crisis in these severe cases it was definitely indicated, but with the introduction of liver by subcutaneous route it is very rarely necessary.

DR. CARDLE: Dr. Beard asks the questions concerning the use of fish liver in the treatment of pernicious anemia. I have not seen any report where they have been used with success. H. M. Conner reported a study on the effectiveness of feeding oysters in these cases, but concluded that the results did not justify their use when more effective materials are available.

DR. J. C. MICHAEL: Dr. Cardle brings up many questions which I know are of considerable interest to all of us. I recall the days when these pernicious anemia patients came to us and died comparatively early. I remember one case we had in which, according to the laboratory standards at the time, we could not definitely establish the diagnosis by blood examination before the patient died of a sclerosis of the cord.

It seems to me from the neurological standpoint, the difficulty lies in getting at these patients early. We have gone thru that period in which there was considerable discussion about the value of liver to the neurologic picture. As Dr. Cardle has said, once you have degeneration under way you have the process which takes from

one to two years to complete itself. It may be that if you push liver new degeneration may stop but one involved there naturally will be scarring and you have the certain neurologic symptoms, though there is some apparent improvement.

I think Dr. Cardle mentioned the parathesia and generalized weakness expressed sometimes in ataxia. The patient cannot walk well, he has impaired use of the limbs. Parathesia and weakness are not necessarily attributed to the degeneration in the cord. I had frequent opportunity to find such symptoms in patients with anemia who did not suffer from the aplastic type. Parathesia is secondary to the effect of the impaired circulation locally involving the sense organs and when the blood is brought up parathesia diminishes.

Dr. Cardle, I think, is very fortunate that he was able to follow such a large number of cases. I would like to ask him what the longest period is that some of his patients have been under treatment, and what is his impression regarding the life period of the majority of these patients after they have been under treatment?

DR. CARDLE: In reply to Dr. Michael's question, many of these have been upon oral liver as long as it has been in vogue. The intramuscular extract has been used for the past eight months. Unless some intercurrent infection comes along we should be able to maintain these patients for a long time, providing of course that they take the liver at regular intervals to maintain good blood level.

DR. C. A. MCKINLEY: I enjoyed Dr. Cardle's paper very much. With regard to local reactions after intramuscular administration of liver extract, I have noted one intense reaction with abscess formation.

DR. CARDLE: So far we have had no reactions and no infections from the administration of this extract, and I hope our good fortune continued. Of course, it is important that particular care be taken in sterilization of the needles, and that the material is not injected too rapidly. There were some early report intimating that liver therapy reduced the blood sugar, but later reports have shown that this is not the case.

DR. C. A. MCKINLEY: I would like to ask Dr. Cardle about the eosinophilia in this series compared with those taking liver by mouth; in a recent instance, after oral administration reaching over 40 per cent.

DR. CARDLE: As stated before, these are be-

lieved to be due to a foreign protein reaction recurring when liver is administered, and not a result of the active principal of liver.

THE SLIT-LAMP IN MEDICAL DIAGNOSIS

DR. WALTER H. FINK

The slit-lamp is one of the most important advancements in ophthalmology during the recent years. It was first demonstrated by Gullstrand in 1911. Since this time a number of workers have added much to it, the outstanding among these being Vogt and Koepke.

Until but recently it has been considered primarily a laboratory instrument. However, at present, due to refinements and accumulated knowledge, it has been put on a basis where it is of great importance in private practice. In some offices it is used almost routinely.

A description of the instrument was given showing the microscope and the illumination necessary for the working of the instrument.

A wealth of knowledge is obtained by using this instrument, which heretofore was not known. It serves as a link between the clinical findings and the histological picture. Information is obtained which is of inestimable importance in the early diagnosis of certain conditions. The use is confined chiefly to inflammatory conditions, also many corneal conditions, which before were not understood, can be more easily explained and diagnosed. Conditions due to injury of the eye can be recognized more accurately and earlier than with previous methods. Iris conditions are diagnosed more accurately, and lens opacities can be accurately located, thus determining the basis of its origin.

The slit-lamp affords valuable information regarding the conditions present after an operation or injury which cannot be obtained from the older methods of examination. This is especially true in the lens, the retro-lental space, and the vitreous. In the cornea the slit-lamp is valuable to locate the exact position of a foreign body, and may determine its nature. The best method to employ is sometimes indicated by the view with the slit-lamp which may demonstrate that the fragment is partly in the anterior chamber.

Perforating Wounds.—The examination of the corneal prism, both with the broad and narrow beam, enables the track of a foreign body to be traced in detail, and it is generally possible to state definitely that a fragment has or has not perforated the cornea. Its wound of entry is seen on the epithelial surface, and its exit on the endothelial. After a certain lapse of time,

probably measured in years, the visible track of a perforation in the cornea disappears and the scar of the wounds of entry and exit are alone visible. This fact is, as we shall see, of great importance from the medico-legal standpoint.

The track of a foreign body can be traced through the anterior capsule, the lens substance, and the posterior capsule. Perforation of the Sclera gives characteristic signs when examined with the slit-lamp. Striations are seen in the vitreous which according to Vogt are pathognomonic of a perforation.

All cases referred for report after accidents with reference to compensation should be examined with the slit-lamp. If in a court case the expert witness on one side has made such an examination and medical evidence for the other side has omitted to use the slit-lamp, an immediate opening is given to an up-to-date counsel to discredit the value of evidence gained from what he could point out was an incomplete investigation.

We have seen how the slit-lamp can at once decide the question as to whether a fragment has actually perforated the cornea or not, and that in some cases an approximate date for the perforation can be fixed. In the lens certain time limitations can be defined; for example, a lesion deep in the lens covered by clear lens cannot be of recent date.

The exact nature of inflammatory deposits and of iris synechiae can be discovered, and it may be possible to show that such could not have been the result of a comparatively recent accident. The presence of striae in the vitreous points to a wound of the sclera. In a large number of conditions the slit-lamp gives accurate knowledge which cannot be gained without it, and the value of accuracy in medico-legal questions cannot be overrated. The production of definite measurements obtained with the micrometer eyepiece may prove to be the deciding factor in a doubtful case.

DR. ERLING W. HANSEN: I think that it is a very good thing that the Clinical Club could have its attention called to this slit-lamp. I find that there are very few people who know what a slit-lamp is, and that there are a good many ophthalmologists who have never used one. As Dr. Fink said, it is still considered more or less as a "play-thing" by a good many men.

More and more it is being used in private offices, and has become, and is becoming, more and more a very useful instrument in diagnosis. Certain other features that have been added in the

way of carbon lamps are helpful in treatment, especially of tuberculous lesions.

Dr. Fink spoke of Vogt and his work. One of the other men is Dr. Koeppe, formerly of Halle, who has done a good deal of work with the slit-lamp. I had the opportunity of taking some work with him, as well as with Dr. Peter Kronfeld, in Vienna. It is interesting to note that both of these men who have done work in Europe are now in this country, Dr. Koeppe at the University of Iowa and Dr. Kronfeld in Chicago.

The importance of the instrument is in the early diagnosis of some of our inflammatory eye conditions, and one of the essential ones is the matter of iritis and iridocyclitis, which I think is what Dr. Fink meant when he spoke of the early diagnosis of sympathetic ophthalmia. The help in making a diagnosis of tuberculous iritis is quite a distinct advantage of the slit-lamp, according to Koeppe.

NEWS ITEMS

Dr. J. J. Seibel, Harvey, N. D., is spending the winter with his family at Reedley, Calif.

Dr. G. H. Purves, formerly located at Tracy, Minn., has moved to Russell and opened offices for general practice.

Dr. J. D. Windel, formerly in practice for many years at Minot, N. D., died recently at his residence at Spokane, Wash.

Dr. G. A. Sarchet, Mobridge, S. D., has been named county physician to fill the vacancy left by the death of the late Dr. Rock.

Dr. Max Maas, St. Paul, a University of Minnesota graduate has opened offices at Cold Springs, Minn., for general practice.

Dr. Rudolph Anderson, Tracy, Minn., surgeon of the Northwestern Railway, was instantly killed in an auto accident near that city this month.

Dr. H. R. Hennessy, former graduate of the University of Minnesota, is now permanently located in general practice at Los Angeles, Calif.

Dr. J. W. Kernohan, a member of the Mayo Clinic staff at Rochester, was recently married to Dr. Eleanor M. Fletcher of Detroit Lakes, Minn.

Dr. C. E. Watz, St. Paul, has taken over the practice of the late Dr. F. A. Dodge, Le Sueur, Minn. Dr. Watz, graduated at the University of Minn., in 1930.

Dr. Robert Goodman, Powers Lake, N. D., was recently married to Miss Alice Hendrickson, of Fargo. Dr. Goodman is a graduate of the University of Manitoba.

Dr. A. M. Treat, Fairview, Mont., has left with his family to spend several months at Vienna, Austria, where the doctor will take a post graduate course in surgery.

Dr. I. A. O'Connor, St. Paul, aged 34 years, died at his home last month, after a short illness. The doctor was a University of Minnesota graduate in the class of 1922.

Dr. P. R. Karn, Ortonville, Minn., has been obliged to resign as county coroner of that county for the past 25 years, and he will now give his entire time to his private practice.

Dr. H. J. Bartron, Watertown, S. D., has been appointed local surgeon of the Chicago, Rock Island Railway Company. Dr. Bartron now represents four railroads that enter that city.

Dr. Daniel Kriedt, who had been a resident of Minneapolis all of his life, passed away last month after a brief illness. Dr. Kriedt was a graduate of the University of Minnesota.

Dr. L. W. Anderson, Atwater, Minn., met with a painful accident recently by a fall on the slippery ice, which fractured his pelvic bone, that will confine him to his home for several weeks.

Dr. Jay M. Cook, Staples, Minn., physician and surgeon, was recently honored by the Minnesota State Medical association by being appointed to the Inter-Professional Relationship Committee.

Dr. S. A. Slater, Worthington, Minn., superintendent of Southwestern Minnesota tuberculosis sanatorium has been named as a member of the executive committee of the Minnesota Medical Society.

Dr. Wm. Duncan, formerly of Watertown, has joined the staff of the Peabody Hospital at Webster, S. D. Dr. Duncan recently returned from California, where he had been doing post graduate work.

Drs. J. A. Thabes, Sr., Brainard and S. S. Shannon, Crosby, were hosts at the home of the former to about 25 physicians last month. This dinner and entertainment is extended each year by the two doctors.

Dr. R. E. Scammon, dean of the medical school of the University of Minnesota, was a guest speaker at a recent meeting of the St. Paul College Club, his paper presented being on "Hospitals of Long Ago."

Dr. William Allen, Rochester, Minn., is still in active office practice at the ripe age of 98 years. Most of his long list patients are now callers at his office, but he still continues a few calls, driving his own auto.

Dr. W. B. Rogers, Havre, Mont., canceled all of his past due bills for professional services up to Jan. 1, 1933. The doctor makes this donation as a New Year's gift rather than have his patients worry over their payment.

Dr. J. V. Anderson, Red Wing, Minn., enjoys a record of continued practice for the past 44 years. Dr. Anderson is a graduate of Rush Medical School and is well known among the profession in all sections of Minnesota.

Dr. Adolph Hirschfield, who has been in active practice in Minneapolis for the past 40 years, died on January 5th from a sudden attack of heart disease. Dr. Hirschfield was a graduate of the University of Minnesota in the Class of 1893.

Dr. J. A. McIntyre was chosen president of the Steele County, Minn., Medical Society; Dr. E. W. Senn vice-president; Dr. D. H. Dewey, secretary-treasurer; Dr. Benedik Melby, censor for three years; Dr. A. B. Stewart, state convention delegate.

The Minnesota Academy of Medicine new officers for 1933 are: Dr. C. D. Freeman, president; Dr. A. E. Wilcox, vice-president; Dr. R. T. LaVake, secretary, and an Executive committee of Drs. Emil S. Geist, James Gilfillan and J. C. Litzenberg.

The Clay-Becker, Minn., Medical Society officers for the year 1933 are: Dr. C. W. Simison, Hawley, president; Dr. A. Larson, Detroit Lakes, vice-president; Dr. J. H. Heimark, Moorhead, secretary. Five new members were elected to active membership.

Brookings, S. D., physicians entertained the members of the Madison Medical Society at their December meeting. After a fine dinner being served, Dean E. R. Searls, gave an interesting talk and "Case Reports" were discussed by Drs. H. Tillisch, M. Davidson, and John Miller.

The Sioux Falls Medical Society held its first meeting of the new year on January 10th with a large attendance. The guest speaker of the evening, was Dr. John Mayo Berkman, of the Mayo Clinic, who gave an illustrated discussion of "Indeterminate Gastrointestinal Hemorrhage."

The bed capacity of hospitals, sanatoria and related institutions in Minnesota registered by American College of Medicine was 26,037. There are 19 hospitals of 50 to 100 beds and 35 hospitals of more than 100 beds, making a total of 54 hospitals approved by the American College of Surgeons.

Dr. Pearl V. Matthaei, Fessenden, N. D., was elected president of the Tri-County Medical association. Other officers include Dr. C. G. Owens, Sheyenne, vice-president; Dr. Herbert VanDeErve, Carrington, secretary-treasurer; Dr. A. F. Hammargren, Harvey, member of the board of censors.

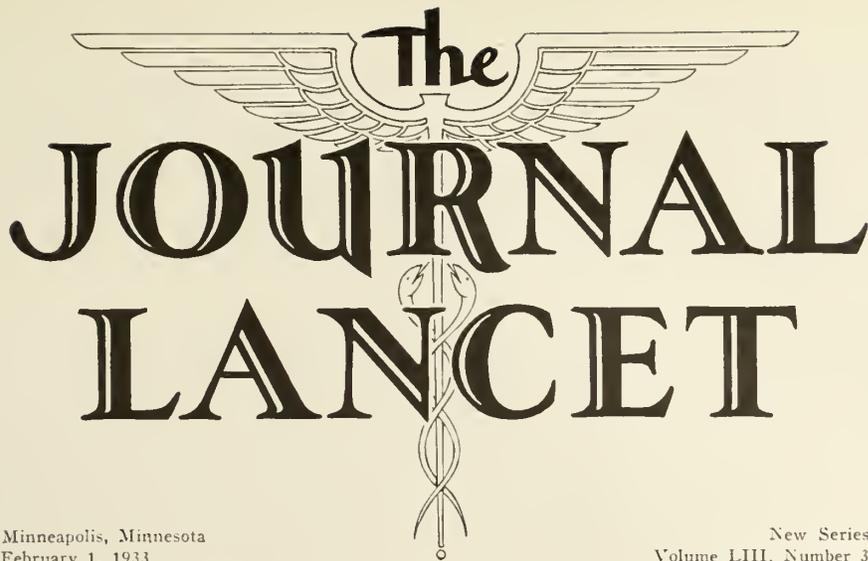
A meeting of the Rosebud Medical Association, was held at Winner, S. D., last month. Papers were read by Dr. H. R. Kenaston, Bonesteel, and Dr. R. V. Overton, Winner. The following officers were elected: Dr. Wm. Matousek, Gregory, president; Dr. R. M. Malster, Carter, vice-president; Dr. R. V. Overton, Winner, secretary.

The program of government ownership and expansion of hospitals for World War veterans can be carried forward only at the expense of the medical profession, the taxpayer and the veteran himself. Expansion of government hospitals while civilian hospitals suffer from a dearth of patients presents a fundamental economic error.

The annual meeting of the members of the Cass County Medical Society was held at Fargo, on December 30th, the following officers were elected. Dr. E. M. Watson, president, Dr. A. C. Fortney, vice-president, Dr. B. K. Kilbourne, secretary. Dr. W. H. Long presented a very interesting paper on the "Treatment of Heart Disease."

Public water supplies, sewage disposal systems, milk supplies, and general sanitation will be under no control after June 30, 1933, unless the coming legislature appropriates sufficient funds to carry on the work of the bureau of sanitary engineering, according to the biennial report of Dr. A. A. Whittemore, head of the North Dakota state department of health.

Dr. A. R. Sorenson, Minot, N. D., was elected president of the Northwest District Medical Society, at the annual meeting held at Minot, where a dinner was served. Dr. Sorenson succeeds Dr. J. L. Devine, Minot, who has been president for the past year. Dr. F. K. Kolb, Granville, was elected vice-president to succeed Dr. H. L. Halverson, Minot.



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SPECIAL INSURANCE ISSUE

Life Insurance and the Depression*

O. J. Arnold

President, Northwestern Natl. Life Ins. Co.
Minneapolis

MEDICINE and life insurance stand on common ground. One seeks to defeat death by overcoming disease and prolonging human life; the other, to alleviate the economic effects of death through the application of a financial plan.

Just as the medical profession represents a vast reservoir of scientific knowledge by which the physical health and wellbeing of every individual benefits, so is life insurance a tremendous reservoir of common funds which, as Herbert Hoover has said, offers men "the opportunity to pool the financial effects of chance misfortune."

The primary function of life insurance—that which sets it apart from all other financial plans—is to project the individual's economic influence beyond the span of his lifetime, by indemnifying his dependents at his death. For those who do not die prematurely, it is a medium of savings and investment by which an old age income may be assured. But another function of life insurance has come especially to public notice in recent years, and in times like the present this secondary function assumes such importance as to almost overshadow the primary purpose of insurance as a means of providing protection against death.

As the depression has progressed, cutting

*Written especially for the Sixty-second Anniversary issue of The Journal-Lancet.

deeper and deeper into the nation's pocketbook, men and women by the thousands have been forced to turn to life insurance as an emergency source of funds. And life insurance has responded, releasing a flood of pent-up dollars of such magnitude as to stagger the imagination. The effect of this life insurance "cushion" against suffering and want has been to make living persons the chief beneficiaries of life insurance. It is safe to say that the future will regard the service which life insurance has rendered to *living persons* as its chief contribution to the public welfare during the depression years. Some idea of the extent to which living persons have benefited from life insurance during these times may be gained from a glance at the following table, which totals the *cash payments* of all United States companies to "living policyholders" during the three depression years 1930, '31, and '32:

Policy Loans	\$2,048,678,000
Matured Endowments	230,948,000
Surrender Values	1,414,252,000
Dividends	212,583,000
Other Payments	337,882,000

These Payments or Benefits to "Living Policyholders" Aggregate\$4,244,343,000

Beside this golden flow of wealth, which has penetrated to every city and hamlet in the nation, even the vast sum of \$1,924,666,000, which rep-

resents payments on death claims to estates or beneficiaries, seems of secondary importance.

Perhaps most remarkable of all to the layman is the fact that life insurance has rendered this great service in what might be termed the regular course of business, without resorting to unsettling methods or practices and without placing undue strain upon its structure. That it has been able to do so is due to just two factors:

1. Legal reserve life insurance is founded upon principles which, correctly administered, produce an institution more nearly immune to financial shocks and upheavals than any other business yet devised.

2. Life insurance company managements have, with negligible exceptions, consistently applied these principles soundly and correctly, with due regard for the function of trusteeship which their position entails.

The prime principle underlying all insurance is *diversification of risk*. The public in general—and particularly medical men—clearly comprehend this life insurance principle as it is applied to the spreading of the risk over a large number of human lives, but there is a less clear appreciation of the extent to which diversity is secured in the investment of life insurance funds.

It is not my purpose in this brief and non-technical paper to enter on a discussion of life insurance investments. But simply to emphasize the extent to which life insurance heeds the warning of the old adage against keeping too many eggs in one basket, I append here a table, based on statistics furnished by life insurance companies having among them the great bulk of the total insurance in force in the United States, showing just how much of every \$100 of life insurance assets is invested in each of the main classes of securities:

Classes of Investments	Of Each \$100 of Assets *(Dec. 31, 1932)
U. S. Government Bonds	\$ 2.10
Canadian Government Bonds	2.40
Other Foreign Government Bonds .....	.10
State, County, and Municipal Bonds.....	3.80
<i>Total Government Bonds</i>	<i>\$ 8.40</i>
Railroad Bonds and Stocks	15.60
Public Utility Bonds and Stocks	9.60
Other Bonds and Stocks	3.20
<i>Total Bonds and Stocks</i>	<i>\$36.80</i>

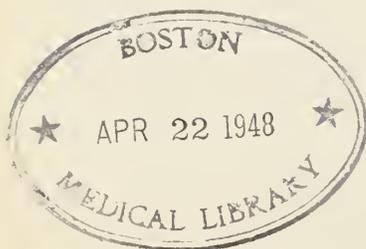
Farm Mortgages	8.80
Other Mortgages	27.50
<i>Total Mortgages</i>	<i>\$36.30</i>
Policy Loans and Premium Notes	18.40
Cash	1.00
Real Estate	4.00
Collateral Loans .....	.10
Other Admitted Assets	3.40
	<i>\$26.90</i>
<i>TOTAL</i>	<i>\$100.00</i>

*Estimated by the Association of Life Insurance Presidents.

The above table only incompletely illustrates the diversification of life insurance funds, showing diversity only as to kind, and among main classes of investments. No attempt is made to indicate diversification within the classes, nor by maturity dates or localities.

Nor is it possible here to touch on more than one of the other main sources of life insurance strength, a strength which has proved, and is continuing to prove, that it is more than equal to the severest trial. That one, however, which I have already referred to as the character of life insurance company managements, deserves more than the passing mention I have afforded it.

Life insurance companies, almost without exception, have traditionally enjoyed management of the highest type. I do not refer merely to the vast background of technical knowledge and experience which life insurance possesses to an extent comparable to medicine itself, and which makes for soundness and a true sense of direction in both these fields. More particularly, I refer to the *quality* of life insurance management, which is best exemplified by the fact that life insurance company executives regard themselves not only as business men in the usual sense, but as trustees of a large share of the nation's wealth. So rarely does a blot occur on the record of life insurance management that any deviation, no matter how trivial, on the part of any management from the traditional code which puts the interests of the policyholder above all others, is likely to cause reverberations out of all proportion to its actual importance. The public appreciates that the life insurance companies are properly regarding its interests, and this appreciation is reflected in the generous measure of confidence which the public continues to bestow on life insurance, and which has actually increased since the beginning of the depression.



The Interpretation of Blood Pressure in Risk Selection*

D. E. W. Wenstrand, M.D.

Assistant Medical Director, N. W. Mutual Life Ins. Co. Milwaukee, Wis.

IN RISK selection blood pressure data can be given accurate values because the mortality statistics developed from many studies of this factor in diagnosis fulfill completely the requirements of the law of averages, for the numbers involved have been very large, the term of exposure sufficiently long, and the group has been essentially homogeneous. Moreover, the early postulates have been demonstrated to be correct by subsequent experience.

In November, 1906, the Medical Department of the Northwestern Mutual Life Insurance Company began to take palpatory systolic blood pressures in its home office examinations, and in August, 1907, examiners in some two score of the larger cities were asked to report such readings in the blanks of all applicants forty years old or over. Within five years 85 per cent of our examiners were furnishing this information at all ages. In 1911 Doctor J. W. Fisher, Medical Director of the Northwestern, prepared and read his first paper on this subject before the Association of Life Insurance Medical Directors. The group was at that time not very large, but the results indicated very clearly that even what was then thought to be a moderate increase in arterial tension produced a high mortality. The study contained cases which had been declined because of high blood pressures as well as accepted risks, which included some at the older ages with systolic pressures up to 160 mm. Doctor Theodore Janeway, in his book, "The Clinical Study of Blood Pressure," published in 1904, expressed the opinion that 160 mm. was probably the highest normal limit. In 1912 Doctor Fisher stated that 145 mm. was very likely the upper limit of safety, and in 1913 first postulated that any systolic blood pressure which was constantly 15 mm. or over above the average for the age would give an increased mortality.

Auscultatory readings, both systolic and diastolic, had scarcely been heard of when we began, and it was not until about six years later that this method was added in the home office examinations and by some of our examiners. In 1917 our examination blank included these additional re-

quirements, but for several years palpatory systolic readings were retained because all our original averages and mortality findings were based upon this standard. We adopted a new measuring rod in 1925, when sufficient data had been collected to warrant the change. It was found that the new auscultatory systolic averages were a little lower than the old palpatory averages, and that the increase at the older ages was not so marked. This perhaps may have been due to several causes, such as better technique, better instruments, more experience and accuracy in taking blood pressures or other more obscure elements; but it was startling to discover that again, as before, systolic tensions persistently 15 mm. or more above the average for the age resulted in an increased mortality. It might be interesting to speculate and to look for specific reasons, but space does not allow more than this statement of fact.

Though the Northwestern was the first life insurance company to require the use of the sphygmomanometer routinely in examinations, the practice gradually became general and the statistical information as it grew always showed that the higher the arterial tension the greater the mortality at all ages. In making these studies, only cases have been included with the single impairment, high blood pressure, but it was found that if other impairments were present 75 per cent of these were cardiovascular, thus confirming clinical experience.

In a short paper it is not possible to reproduce various tables which are available, but it might be interesting to summarize briefly some of the Northwestern's data. For example, the palpatory systolic averages already referred to varied from 122 mm. at age 20 to 135 mm. at 60 (50,000 cases), while the variations in the 64,574 auscultatory systolic readings, taken from 1915 to 1920 inclusive, showed averages from 120 mm. at 20 to 133 mm. at 60. Another table of averages was constructed from readings recorded by selected examiners from October, 1922, to October, 1923; and in this group the range ran from 120 mm. at 20 to 130 mm. at 60, a rise of 1 mm. for each

*Written especially for the Sixty-second Anniversary issue of The Journal-Lancet.

five years up to 50, after which there was an increase of 2 mm. for each 5-year period.

In a study of 3,640 cases rejected solely because of high blood pressure from 1907 to 1920 inclusive, with the mortality computed to the anniversary in 1921, the ratio of actual to expected mortality, all ages combined, by the American Men Table follows:

15 to 24 mm. over the average, 125 deaths—184%
 25 to 34 mm. over the average, 111 deaths—204%
 35 to 49 mm. over the average, 121 deaths—249%
 50 and more over the average, 124 deaths—415%
 The Company's general mortality experience by the same table and during the same period was approximately 80 per cent. It should be explained that if the actual and expected deaths are the same the mortality is actuarially called 100 per cent.

So far, nothing has been said about the interpretation of diastolic pressures, because the information at hand is not nearly so conclusive, though for many years it has been the practice of most companies to rate or decline applicants who have shown unusually low or high diastolics. It has also been quite generally observed that when both systolic and diastolic pressures are high it is safe to assume that additional readings will not show much change in the tension. On the other hand, an original high systolic with an average diastolic is often due to emotional or some other temporary influence. This is why it is so essential to take several readings if the first one is high, to make sure of the actual tension. In otherwise normal individuals it is not uncommon to find a systolic pressure which will come down ten, twenty, thirty, or even fifty millimeters in a few minutes, where the diastolic remains practically constant or varies only a few millimeters close to the average. We have some figures which seem to demonstrate that cases of this kind produce only a small increase over the general mortality, which is probably due to the inclusion of an occasional hypertensive individual, as we know that such now and then show a normal pressure. More and more attention is being paid to variable blood pressures, and definite statistical information will be available when the class has grown larger and the exposure longer. Whenever additional readings are called for in this group, samples of urine are also carefully examined for slight traces of albumin and occasional casts. Should either or both be found it is our practice to decline the case.

At the last meeting of the Association of Life Insurance Medical Directors, Doctors MacKen-

zie and Wells, of the Prudential, and Mr. H. R. Bassford, Assistant Actuary of the Metropolitan, presented papers on the evaluation of diastolic pressures, which seemed to demonstrate that the full effect of high diastolics on mortality does not occur until after ten years of exposure. However, such diastolics were, generally speaking, 100 mm. or over, and the systolics were also relatively high. This is a fruitful field for further investigation, especially as far as extra ratings are concerned. The Northwestern, which issues only standard insurance, has never accepted a risk where the diastolic remained over 100 mm.

Perhaps enough has been said to show briefly how blood pressure is interpreted by medical directors, but I should like to add that it is recognized by all of us that many individuals with a high tension live comfortably for a long time. However, in the selection of risks for life insurance, one should primarily disregard the individual and think in terms of large groups, depending upon the law of averages for satisfactory results. From mortality statistics, the life expectancy of any one person cannot be predicted, but what degree of longevity may be expected in a homogeneous class can be foretold, provided it is large enough and has been under observation for a sufficient number of years. The larger the group and the longer the exposure, the less becomes the coefficient of error. Still, by bearing this in mind and by applying the mathematical formula for the Probable Deviation in mortality ratios it is possible to get valuable information as to trends even in relatively small groups.

In conclusion, allow me to call attention to the fact that life insurance statistics are based upon the statements made by the applicants, the examiners, the agents, and in confidential reports; therefore, the information comes to the medical selector as assertions which are not always susceptible of proof. Nevertheless, because of the size of the groups the percentage of error is considered negligible. This brings to view the importance of the place filled by the local medical examiner, who represents the medical department in the field and who assists not only in risk selection but who also can help in making the statistical studies even more accurate by eliciting the facts fully and completely when the applicant is being examined. It is the hope of all medical directors that the co-operation between them and the profession at large will become closer. Such statistical data as we have are yours for the asking.

Danger of Non-Medical Insurance Examinations*

A. E. Hedback, M.D.
Minneapolis

IT IS alarming to note the tendency of some insurance companies to revert to their earliest practice of non-medical life selection. It is discouraging to be thus told that scientific achievement and training during these many years appear to count for naught, and that heretofore supposedly indispensable methods of observation are to be discarded as superfluous and unnecessary.

It is not the loss of revenue and prestige altogether that prompts these lamentations, but rather a deep-rooted conviction that the method by which such decisions were arrived at was faulty, and that it will prove itself costly to the companies indulging in the experiment. Actuaries deal in generalities, by the saving grace of the law of averages; but to label the individual for expectancy classification, he must be hand-picked by someone.

The medical examiner is fully aware of the shortcomings of any examination handicapped by the personal equation that enters so largely into the life insurance business, and he knows, too, that the longevity of no single individual can be accurately determined by any examination or calendar yet devised. He is convinced, however, that there is no substitute for the trained physician in risk selection, and the very fact that selfish interests enter into the problem, makes this doubly true. No one knows better than he, how to say "how do you do?" in so many different ways from one side of the report blank, and then answer how he really appears to be on the other. The applicant will rarely attempt to deceive the interviewer when the latter is known by him to be a physician, lest watchful eyes detect the misrepresentation. The prevalence of this impression alone, is sufficient reason for the employment of a doctor in every case.

The medical directors of this country are to be admired for the wonderful records they have made, and this in spite of being seated so close to the well-intentioned but ambitious "money changers" who daily stress expediency and ever increasing production at reduced cost, to the point where the need of a preliminary examination is questioned and clairvoyance must be substituted.

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An examination necessitates delay and inconvenience to the underwriter, to be sure, but so does the searching of titles to the real estate agent, and who can say that the omission of either is not a dangerous and "penny-wise" practice? The smaller-amount applicant has been the chosen recipient of this favor; but why the amount applied for should make any difference is not clear. It surely cannot be shown that honesty and good health are the universal possession of those with little means, and the applicant who has a secret impairment can certainly find companies enough to make small policies in each, amount to quite a sum.

It has been implied that glaring inconsistencies have appeared to undermine confidence in preconceived expectation of results, and that recently compiled figures have not been so impressively affirmative as to fully support the need of an examination expenditure in all cases. But disappointments in the past should be met, not by casting caution to the winds and relying on chance and lay information, but by logical adjustment to the times. Even if the premise were right, is it not clearly apparent that these companies have made erroneous deductions from their statistics and are carrying out an economic experiment in the wrong direction? If an article that has been obtained at a certain cost proves disappointing, is it not reasonable to assume that the remedy must lie in paying more rather than less? Not only should the local examiner be paid more in certain cases but some additional money might be expended in promoting a more personal contact between him and the medical director. He will be a better examiner if he visits the home office or has an opportunity of talking with the medical director now and then. The latter should appoint a co-ordinator whose functions it would be to get away from the halls of technocracy, keep in touch with the profession at scientific meetings, and make occasional excursions into the field. Nothing promotes understanding like a personal acquaintance, and that, after all, is one of the most important, interrelated functions involved. The maintenance of a healthy perspective of things as they are, and unbounded co-operation and confi-

(Continued on Page 56)

Advertising the Physician*

W. P. Shepard, M.D.

Assistant Secretary, Welfare Division,
Metropolitan Life Insurance Company
San Francisco, Calif.

*The doctor's armor has no cracks—
But thus you tell him from the quacks.¹*

IT MUST be about ten years ago that the Hennepin County Medical Society held a joint meeting with representatives of the press. It was a most entertaining evening. One still recalls the eloquence and logic of one of the editors who maintained that the doctor needed advertising. Of course, he and his colleagues were given good reasons why we could not accept advertising, and certainly during these ten years there has been little disposition evidenced on the part of physicians to take advantage of the kind of advertising there recommended.

To one who has inherited the physician's traditional objections, it seems useless to try to sell the doctor advertising space in magazines and newspapers. Your attention is invited to the fact, however, that advertising is not all done through the newspapers and magazines. There are other kinds of advertising operating to the benefit of the physician which are more effective and much more acceptable. They are kinds of advertising going on under our noses every day in the year. They can be made of even greater value than at present if we recognize and foster them.

The word "advertising" comes from the Latin "advertere," which means "to turn to." The same root is found in the French word "avertir," formerly spelled "advertir," which means "to warn or give notice to." We are familiar with another English word of this same derivation, "advert," which means "turn the attention to." To advertise is to announce, apprise, inform, proclaim, promulgate. These are respectable meanings for a perfectly good verb which may have suffered unjust condemnation. Only when "to advertise" is used in the sense of "the act of making known by public notice, especially by print" or "the art of announcing or offering for sale in such manner as to induce purchase" do we have ethical objection to it. In fact, it can be shown that we have used advertising in an ethical manner for centuries, and could not have done business without it.

From time immemorial, the medical profession

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has had something to sell to the public, which the public did not know it needed. There is nothing in mythology to show that the priests of Aesculapius were accorded the opportunity to meet the needs of every person who became ill. Ancient history does not assure us that the tribal medicine man was universally consulted by all who needed his services. While Hippocrates and Galen led fairly busy lives, there is no way of telling how many people of their day needed the services of modern medicine, such as it was then, but for one reason or another failed to get it. The pilgrim fathers often fell ill and succumbed without medical aid. The gold seekers of '49 left many of their number along the way when illness overtook them. There was no doctor present to minister to the victims of cholera and mothers in childbirth. When cholera halved the population of Sacramento in 1850 and 1851, the single doctor present records an extremely busy time, but it is safe to assume that he was unable to attend more than one-tenth of the victims.

In other words, down through the centuries, people have sickened and died as the fates decreed, some with and some without "benefit of clergy," so far as medical attendance is concerned. As more and more people have come to appreciate the advantages of modern medicine, those same advantages have increased many fold. More people need medical advice today than ever before, not only to recover from illness, but to avoid it. It is doubtful, therefore, whether even now medicine is reaching a greater proportion of those who need it than were reached in ancient times. In fact, according to the report of the Committee on Costs of Medical Care, the physician receives only a small fraction of the total amount spent for illness. How, then, has it come about that the United States today supports, even with some inadequacy, over a million persons engaged in the care and prevention of illness? The answer lies, I believe, in advertising; advertising not in the commonly accepted sense of the term, meaning in print, but in much more effective ways which we often lose sight of.

Most modern sales advertising is based upon the so-called mass approach; that is, to inform the largest possible number of people at the least expense. This may be the most expedient method from the standpoint of the salesman, but it is not necessarily the most effective. Much of it falls on the deaf ears of the disinterested. The individual approach is far superior to the mass approach since it reaches a more select group of interested persons. This the physician is doing every day with every patient. It is usually recognized in salesmanship that one satisfied customer will bring in new business more effectively than any other means. Thus, the physician's first and most effective means of advertising is to please each patient. It would seem unnecessary to point this out, except that in the present-day intricacy of medical practice, including as it does reference to numerous specialists, group practice, inter-dependence on hospitals and nursing staffs, laboratories, and what not, it does sometimes occur to the casual observer that the patient's comfort and peace of mind are not always uppermost in the mind of the physician. Some of us have grown away from the ready sympathy, unhurried consultations, invariable courtesy and kindly consideration of the old family physician. Neither elaborate offices, nor an efficient corps of assistants, nor the greatest of scientific skill in diagnosis and treatment, in fact, nothing else the doctor can do, will take the place of always pleasing the patient.

We have something to sell, then, which many, many people, perhaps a majority, do not know they need. We shall probably have to continue to do as we have always done, that is, lift ourselves by our own bootstraps, so far as display advertising is concerned. But we cannot afford to neglect the types of advertising which are within the limits of propriety. We have at our disposal the most effective means of advertising yet devised: The satisfied customer.

The second means of advertising, which rounds to the physician's benefit, is the public health agency, either official or voluntary, and that agency's field representative, the public health nurse. This matter of supplying health advice and care to a mass of people who do not know they need it has become a public health problem. It is obvious that both health and lives are lost because too few know when they need a doctor. For that and other good reasons, during the last forty years there has grown up in this country a rather surprising public health machinery, designed to prevent unnecessary loss of

life and health. This is a machinery partially, and often inadequately, supported by taxation. In other words, the people are willing to pay a little for their own education. It is a machinery more generously supported by voluntary contributions of a charitable nature, such as the Christmas Seal Sale; or supported by vast philanthropic foundations which are tangible evidences of American culture. According to the Twentieth Century Fund, the combined expenditures of the foundations interested in medicine and public health work in this country are of the magnitude of \$18,000,000 annually. The activities of most public health organizations react either directly or indirectly to the benefit of the progressive physician.

For example, in a cross-section sampling of over 6,000 western children, we found that 24 per cent had been immunized against diphtheria. Of these, 26 per cent had been immunized by the private physician. Even though some may feel that this is too small a percentage, it is probably safe to say that it is largely a pure gain for the physician. Without the urging of the public health agency the parents of young children would not have known that it is a good investment to buy diphtheria protection from their physician. Public health agencies exist largely for the very purpose of health education, much of which advertises the physician. The physician can well afford to keep himself informed of the activities of his local health department in order that he may co-operate with the many worthy purposes of this branch of local government. If at times he is irritated by something which the public health nurse is reported to have said, it is well to bear in mind that in the first place the probabilities are she did not say it, but was misunderstood by the hearer. In the second place, if she said something which was not correct according to most recent scientific knowledge, her superiors need merely be informed to bring about immediate correction.

A third method of advertising is operating to the benefit of the physician. It is one even more commonly misunderstood than the activities of health agencies. This is the health education and health service program of the modern public school. The history of the school health movement with its rapid growth in the last twenty-five years is as astounding as it is confusing to some physicians. This movement has taken the schools by storm. It has increased the interest and fired the imagination of teachers, school administrators, and parents alike. In 1918, a com-

mission appointed by the National Education Association on the reorganization of secondary education stated that health was the first objective in education. Schools have been forced to recognize the importance of the health of children, if for nothing more than to satisfy popular demand. Quite aside from this, however, it is obvious that the school has a legitimate and proper interest in the health of the child. If the teacher succeeds, she must know something of the physical condition of her pupils. If the future generation is to enjoy good health and avail itself of the advantages of modern medical care, the children of the present generation must be taught what that all means. If the school is required to provide physical as well as mental exercise for the growing child, the school has a right to know what kind of exercise and what proportions of each will best suit each child. On the basis of the child's physical condition the school is usually able to offer more study or less, more exercise or more rest, corrective gymnastics, favorable seating for children with defects of vision and hearing, avoidance of stair-climbing for cardiacs and asthmatics, a visiting nurse if desired, a visiting teacher for convalescents.

It is right here that a misunderstanding between the profession of teaching and of medicine often arises. The modern, well-conducted school health program results in the discovery of an amazing number of unrecognized physical defects in nearly every group of children. It brings about the correction of from 25 per cent to 80 per cent of these defects. It thus contributes directly to increasing the activities of the physician. Despite this, the physician's attitude toward this valuable activity is all too often skeptical or even cynical. He scoffs at the school nurse, tears up the refer-slip from the school physician and proceeds to tell the parent that it's all poppycock!

It is well for the physician, therefore, to bear in mind that the school has a logical interest in the health condition of each child; that the school nurse and school physician attempt to do little more than to detect abnormalities, not ordinarily to make diagnoses; that the child's parents are urged repeatedly to seek the services of their family physician for diagnosis and treatment of the suspected abnormality; that the school is only too glad to have advice from the family physician concerning curriculum modifications

which he may desire for the benefit of his child patients.

Whether we like it or not, health teaching will be and should be provided in the public schools. It will appear to the physician oftentimes that this teaching is dogmatic. Indeed, it must be. The training of the average teacher cannot possibly provide her with personal observations on the truth of certain scientific facts. The teacher must nearly always quote from trusted authorities. Unfortunately, in the past the teacher has not always been in a position to discriminate between good authority and bad. The teacher is learning rapidly. She is anxious to learn more. She will welcome kindly counsel and information from the physician. She will resent destructive criticism.

Finally, there is a form of even newspaper and magazine advertising which is all to the good so far as the physician is concerned. This is the advertising done by certain insurance companies and by certain of the pharmaceutical houses. It advertises the physician collectively, not individually; it presents the profession to the public in a favorable light; it is, for the most part, skillfully done and must be of benefit to the profession.

On the whole, it seems to me that the physician was never better advertised than he is today. It behooves us to recognize these favorable and unobjectionable methods of advertising and to foster and encourage them in every possible way.

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DANGER OF NON-MEDICAL INSURANCE EXAMINATIONS

(Continued from Page 53)

dence would be the result. Reports would be better understood and more understandable.

If any good is to come out of this veiled threat, it will probably be an increased desire on the part of each examiner to prove himself to the company. He will endeavor, before it is too late, to justify the faith that some companies continue to have in him, firmly believing that comparative statistics will eventually show his contention to be right, that the services of examiners will be found indispensable to all companies, in all cases, and that they will be found deserving of the twenty million dollars annually that have been paid them in the past, *and even more.*

The Kingsbury-Clark Method for Albumin and the Benedict Picrate Method for Sugar*

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THE determination of albumin and sugar in the urine may be made by using any one of numerous methods. Often one makes a preliminary qualitative test and follows this with a quantitative estimation. The tests which are to be described serve both as qualitative and quantitative tests.

In order to secure reliable results in urinalysis, it is of the utmost importance that the urine should either be freshly voided or preserved with a suitable agent. Kingsbury, when in charge of this laboratory a few years ago, compounded a tablet which has a very efficient preservative action. Experience shows that less than two per cent of the urine specimens sent to the Home Office from all parts of the country east of the Rocky Mountains are decomposed. One tablet is sufficient for 45 cc., or one and one-half ounces, of urine. The preserving action of this tablet is due to formaldehyde liberated from hexamethylenetetramine, to sodium benzoate, benzoic acid and a trace of mercuric oxide. The tablet is buffered so as to give an acid reaction.

These tablets, as well as the standards and other supplies required for the tests for albumin and sugar, may be obtained from R. P. Cargille, Selling Agent, 26 Cortlandt Street, New York.

TESTS FOR ALBUMIN

The time-honored reactions for albumin are Heller's ring test and the heat and acetic acid coagulation test. The results of these tests are recorded in various ways, as for instance, "slight trace," "trace," "plus" and "two plus." While this system of notation has definite meaning to a given individual or laboratory, the meaning to another may well be totally different. The method to be described is quantitative and the findings obtained by one person are comparable with those of another. Such uniformity of results is of great importance, especially in life insurance work.

The quantitative test for albumin is based upon the precipitation of albumin by sulfosalicylic acid. The amount of albumin is determined by

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comparing with a series of standards representing from 10 to 100 mg. of albumin per 100 cc. of urine. This comparison may be made either by daylight or by using the Clark lamp. The lamp is essential when the laboratory is dark or when natural illumination is variable. It is obvious that the tubes containing the standards and those in which the tests are made must be identical.

The Kingsbury-Clark test is made as follows: Pipette 2.5 cc. of centrifuged urine into a test tube graduated at 10 cc. and add 3 per cent sulfosalicylic acid (30 grams dissolved and diluted to 1000 cc. with distilled water) to the 10 cc. mark. Invert the tube to mix, allow to stand 10 minutes and compare the turbidity with the permanent turbidity standards. Record the value of the standard most closely matched, as the albumin content of the urine. Seven standards are used, equivalent to 10, 20, 30, 40, 50, 75 and 100 milligrams of albumin per 100 cc. of urine. In case the specimen contains more than 100 mg. albumin it may be quantitatively diluted and redetermined. By multiplying the value found by the number of times the specimen has been diluted, the desired result is obtained.

A detailed description of the method will be found in the original paper by Kingsbury, Clark, Williams and Post.¹

The albumin outfit is shown in Figure I.

A value of 50 mg. of albumin per 100 cc. of urine obtained by this method corresponds to what is usually designated as a "trace" when the Heller's or the heat and acetic acid test is used.

A simpler outfit designed for the physician's use is illustrated in Figure II.

It is often not necessary to know the absolute amount of albumin present but only whether there is more or less than a given amount. In such a case, one can very well use a portable outfit containing one standard representing 50 mg. of albumin per 100 cc. This outfit has been used by our Visiting Nurse Service for the last two years. It is shown in Figure III.

Although the albumin standards are referred to as being permanent, this is not strictly true.

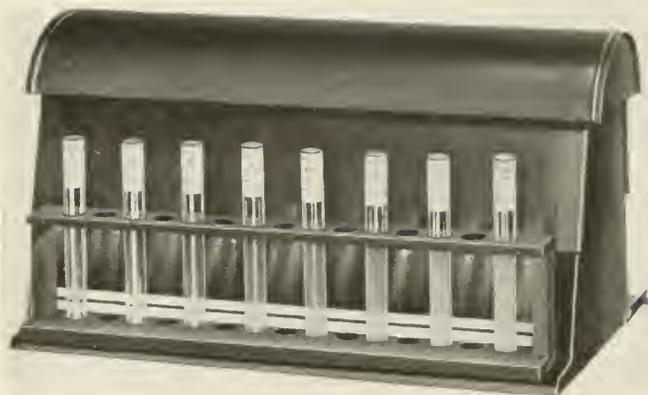
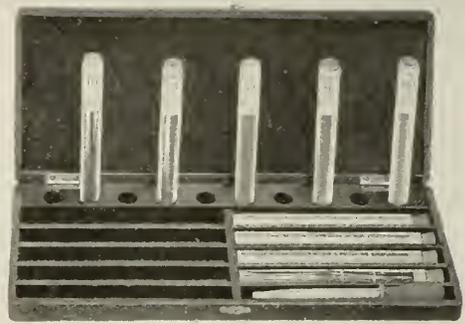


Figure II



After about nine months the lighter standards tend to become more so and thus yield results which are somewhat too high. The entire set of standards should be replaced every nine months.

TESTS FOR SUGAR

Most qualitative tests for sugar are made using copper solutions. Benedict's solution and Haynes' solution are the reagents generally utilized for this purpose. These are strictly qualitative tests. The test to be described is both qualitative and quantitative.

Benedict's picrate method is used in estimating the sugar content of urine. When an alkaline picrate solution containing glucose is boiled, a brownish-red color is produced. This color is compared with permanent standards representing definite amounts of glucose. A similar color is produced by creatinine but this color is destroyed by the addition of acetone. The standards are made by mixing acid solutions of ferric chloride and cobalt chloride.

The method is described in Practical Physiological Chemistry by Hawk and Bergeim.²

The test is performed in the following man-

ner: Measure 1 cc. of centrifuged urine into a test tube graduated at 25 cc. Add 3 cc. of picric acid solution (2 grams of pure dry picric acid per liter) and 0.5 cc. of 5 per cent NaOH. Add next 5 drops of 50 per cent acetone solution (prepared fresh each day by diluting acetone with an equal volume of water) and place the tube promptly in a boiling water bath. In 12 minutes remove the tube, cool and dilute the contents to 25 cc. Compare this colored solution with the permanent standards in tubes of the same internal diameter and estimate the amount of sugar. Five standards, 0.1, 0.2, 0.3, 0.4 and 0.5 per cent are used. In case the urine contains more than 0.5 per cent sugar it is diluted quantitatively and the determination repeated. The value of the standard most closely matched multiplied by the number of times the urine has been diluted gives the desired value.

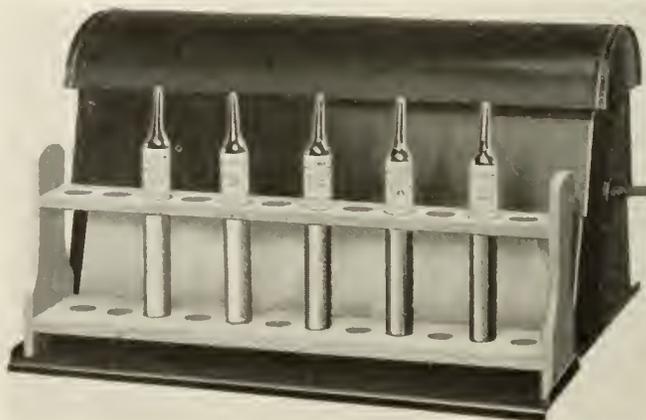
The sugar rack and standards are illustrated in Figure IV.

EXPERIENCE WITH THE METHODS

Specimens of urine of all our Home Office employees (now numbering about 13,000) are

Figure IV

Figure III



examined once a year. Such a group may be considered to represent an average cross section of the population. The methods for albumin and sugar have been in use in this laboratory for seven years and the results indicate what one may expect when they are used.

Eighty-nine and three-tenths per cent of the urines gave negative values for albumin, 4.2 per cent contained 10 mg. per 100 cc. and 2.2 per cent had 20 mg. of albumin per 100 cc. Ninety-five and seven-tenths per cent of all specimens contained 20 mg., or less, of albumin per 100 cc. of urine.

Sixty-seven and two-tenths per cent of all specimens showed less than 0.1 per cent sugar, 12.3 per cent contained 0.1 per cent, 14.7 per cent had 0.2 minus per cent and 2.1 per cent of the specimens indicated 0.2 per cent of reducing

substances. 96.3 per cent of all the urines examined contained 0.2 per cent, or less, of reducing substances. It should be noted that negative values for sugar are never found when the Benedict picrate method is used. Amounts up to 0.3 per cent, when the specimen has a specific gravity of 1.025, or more, are accepted as normal providing there is no history of diabetes.

SUMMARY

The Kingsbury-Clark method for the determination of albumin and the Benedict picrate method for the estimation of sugar are briefly described. Typical values for albumin and sugar are recorded.

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Axiomatics in Electrocardiography for Insurance Companies*

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I AM repeatedly asked by insurance examiners as well as by the Home Office personnel the value of the electrocardiogram in various problems which arise in making a judgment whether a prospect is a good risk or not. To provide answers for these questions I have established certain axioms for insurance examiners which cover the degenerative processes of the heart as they are related to electrocardiography. However, one of my director friends has asked me to discuss certain other points which have come up in his work. I will attempt to do this by stating his queries and answering them categorically. The axioms are appended.

1. The prospect with a slight tendency to increased pressure, 145-50 systolic 90 diastolic, electrocardiogram normal, heart size and contour normal, is such a person a standard or substandard risk?

I would consider him substandard.

2. The problem of the rapid pulse in the latter decades?

A rapid pulse in a normal adult (we are excluding exertion) is usually an emotional affair or a sign of a tired heart. The electrocardiogram may or may not give you information on this point.

3. A pulse that has a basic rhythm with extra

beats interposed—what is the significance of the same?

Extra systoles in adults in the later decades may be a normal manifestation of the individual's cardiac physiology. The interpretation of Mackenzie given out years ago is still applicable. Extra systoles have more significance of myocardial damage in the later decades than in the earlier ones.

4. Given an applicant with a long insurance record of questionable heart involvement, would an electrocardiogram be of value?

Yes. If such a tracing is normal, it should add to the judgment in favor of the prospect.

5. What is the significance of the deep Q wave on lead iii.?

Some years ago Pardee called attention to this in relation to myocardial changes. Opinion is still divided. There is no question it is of value in interpreting a tracing when evidence in other leads is present.

6. What is the significance of low amplitude (low voltage) in a tracing?

As an insurance problem, none whatever. A failing heart may give a high amplitude, a healthy myocardium may give a low amplitude. Electrocardiographers pay little attention to the amplitude of the Q. R. S. except as it relates to some specific clinical problems.

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7. Give us the upper limits of the timing of the various complexes.

The upper limits of normal timing of the various complexes for the P. R. interval is .20 seconds; for the Q. R. S. is .10 seconds. Variations in the S-T interval have been tried as a method of differentiating changes in the myocardium. So far nothing of significance has come of it.

8. Given a case that has had an acute coronary closure in which there has been evidence by the electrocardiogram during the attack of variations such as negative Ts, prolongation of the P. R. intervals, with S-T variations, etc., does this tracing ever become normal? In other words, is the electrocardiogram a good criterion so that we can eliminate this type of risk?

The answer to this question is given in axiom VIII.

9. Will the electrocardiogram be of any value in cases of mitral disease in which there is practically no auscultatory findings diagnostic of the same?

The electrocardiogram does not assist in making valvular diagnoses. Occasionally it may be used to differentiate a mitral from a congenital heart. An oesophagogram would be a better way to do this. I personally cannot imagine a "mitral heart" without physical findings. That there must be a stage when this does exist is without question. The electrocardiogram cannot give us any information on this point.

I. The electrocardiogram gives us evidence of changes in timing (rate and rhythm) and changes in direction of flow of the electrical potential.

II. Changes in direction as manifested by deviation from the standard assumed as normal are

of most importance to the Insurance Companies.

III. The problem as it usually presents itself to the Home Office is the cases up in the degenerative decades with no stigma in his "insurance" history nor in his physical findings.

IV. Experience has shown that persons exhibiting variations in direction of flow in the degenerative decades do not live as long as non-variants.

V. There is no standard variation for coronary insufficiency nor of myocardial changes.

VI. The Pardee S-T variation is a definite standard of variation in acute coronary closure.

VII. However acute coronary closure particularly in the "silent area" does not indicate itself in the electrocardiogram.

VIII. Some hearts after closure often lose the definite standard (Pardee S-T- variation) but a certain aberration will persist.

IX. The insurance examiner is justified in asking for an electrocardiogram in a prospect over 40 years of age in whom he cannot find any evidence of cardiac disease, but whose family gives a history of cardio-vascular deaths.

X. An aberrant electrocardiogram which cannot be explained on a toxic basis, and this includes thyroid effects, should be looked upon as indicative of reduced longevity.

XI. The electrocardiogram changes in normal hearts as the age period advances. For a space in adult life, when taken in a well standardized machine the tracing is almost as accurate in its identity as finger prints—and just as individual.

XII. It is a pity that so far we have not standardized the electrocardiogram of the heart by decades.



Insurance Protection*

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Commissioner of Insurance
St. Paul

PRACTICALLY every person in this state is protected, directly or indirectly, through insurance of some kind; even though he may carry no life or accident insurance and though he may own no property upon which to place fire or other coverage, yet if he is employed in any capacity, his continued employment is to a great extent contingent upon the protection against loss from fire or other catastrophes which his employer provides through insurance. He is likewise protected through Workmen's Compensation, Public Liability, or other similar coverages, although not a policyholder himself.

Because of this fact, but more particularly because of the peculiar trust relation existing between insurance carriers and the public, the State exercises a closer supervision over this business than it does over most other classes. This supervision is committed to the State Insurance Department.

This department was established in 1872 as an agency for the enforcement of the various insurance laws of the state. Since then its powers have been increased from time to time and new duties added. At present the Commissioner of Insurance is also State Fire Marshal, and is a member of the Commerce Commission, the Compensation Insurance Board, the Teachers' Insurance and Retirement Board, and the State Employees' Retirement Board.

The Fire Marshal's division of the Insurance Department, as its name indicates, has to do with the inspection of property, with reference to fire hazards, the investigation of suspicious fires, the licensing of theaters and dry cleaning plants, and the promulgation of information with reference to fire prevention in general. This division of the Insurance Department receives no appropriation from the state but is financed through the tax of three-eighths of one per cent upon fire insurance premiums written within the state.

The Compensation Insurance Board, of which the Commissioner of Insurance is a member, has the duty of fixing Workmen's Compensation insurance rates so that the same are adequate and

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reasonable and so as to ensure the solvency of the carriers writing this class of insurance.

The Commissioner of Insurance together with the Superintendent of Banks and the Commissioner of Securities compose the Commerce Commission, which Commission has to do with the registration and licensing of the sale of securities within this state, the licensing also of brokers, chartering of banks, and the licensing of insurance companies to transact business within the state. Each member of the commission acts independently of the other two upon all matters relating to his own department, except in the respects above mentioned.

One of the important duties of the Insurance Department is to examine the records of insurance companies authorized to transact business in this state. The law provides that the Commissioner shall visit each domestic insurance company, other than township mutual fire insurance companies, at least once in every three years, and oftener if he deem it advisable, and to carefully examine its affairs for the purpose of ascertaining its financial condition and its ability to fulfill its obligations, and to further ascertain whether it is complying with all the insurance laws of the state. He may also examine foreign insurance companies admitted to this state, as well as those applying for admission. However, the examination of foreign companies is ordinarily made in conjunction with insurance departments of other states.

At present there are over 700 domestic and foreign life, fire and casualty insurance companies licensed to transact business in this state. Each company, domestic and foreign, as a prerequisite to securing a renewal license, must file with the department a sworn statement of its previous year's business showing its present financial condition. These statements are audited by the department before the end of the license year.

All insurance agents must also be licensed by the department before writing any business. During the past year some 55,000 requisitions for agents' licenses have been acted upon by the department and licenses issued. This does not

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Financial Stability of Life Insurance Companies*

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THE preeminence of life insurance as a goal of economic security has become increasingly apparent after three depression years. Life companies are a vast reservoir for individual savings and may be said to be managing trustees for their 67,000,000 policyholders.

How well insurance companies have administered these trusts is reflected in the magnitude of insurance company operations during the past three years. Forty-eight companies holding 86.4 per cent of the admitted assets of all United States legal reserve companies paid out in cash the enormous total of \$6,106,000,000, an average amount for each year of \$2,056,336,000. Payment of death claims amounted to \$1,924,666,000. The remaining \$4,244,343,000 was paid to living policyholders. Of this latter amount, \$2,048,678,000, nearly 50 per cent, represented policy loans and undoubtedly was a large factor in mitigating hardships in those cases where other resources had been exhausted. These figures make the operations of the Reconstruction Finance Corporation seem small by comparison.

Notwithstanding enormous demands for policy loans and surrender values, the cash resources of the companies have very generally met the situation so that comparatively little liquidation of their securities has taken place.

The institution of life insurance, by its certainty of performance has so completely exhibited its stability and usefulness, under conditions of economic strain, as to abundantly justify the confidence it has enjoyed with respect to both its service to its policyholders and the national welfare.

The explanation of the strength of life insurance is comparatively simple. No massing of demands for instant liquidation of all, or even a substantial part, of its liabilities is a possibility. Neither is it subject to the danger of sudden and immediate interruption of its entire income. Income in the form of premiums and interest may be said to be constant. But, even if extraordinary demands occur these are provided for in resources designed to meet emergency needs.

Ability to diversify their investments is an element of inherent strength in life companies.

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not only in respect to security but, importantly, as to liquidity. Diversity brings into the investment portfolio a healthy variety of investments in industries and in geographical location and a balanced distribution among government, municipal, corporate, and mortgage loan investments. It also supplies a dependable volume of maturities constantly providing large sums for current use or for reinvestment.

This diversity of investments is pictured in the following table giving the percentage distribution of the combined assets of fifty-two companies holding more than 90 per cent of the admitted assets of all United States legal reserve companies. The data for three different periods has been selected: 1921, a year of depression; 1929, a peak year of prosperity; and recent data for 1932. The figures indicate the constant state of flux in the composition of the assets of life insurance companies as they adjust their positions to changing economic conditions.

	Dec. 31, 1921	Dec. 31, 1929	Sept. 30, 1932
Farm Mortgages	17.7%	12.0%	9.0%
Other Mortgages	16.7%	30.0%	27.6%
U. S. Government Bonds	10.7%	2.0%	2.1%
State and Municipal Bonds	4.6%	3.4%	3.8%
Canadian Government and Municipal Bonds	2.1%	2.3%	2.4%
Other Foreign Government and Muni- cipal Bonds	1.5%	.2%	.1%
Railroad Bonds and Stocks	22.9%	17.7%	15.6%
Public Utility Bonds and Stocks	3.0%	9.0%	9.6%
Other Bonds and Stocks	1.4%	2.6%	3.2%
Policy Loans and Premium Notes	13.0%	13.3%	18.0%
Real Estate (Including Home Office) ..	2.0%	2.2%	3.7%
Collateral Loans .....	.4%	.1%	.1%
Cash	1.2%	.8%	1.2%
Other Admitted Assets	2.8%	4.4%	3.6%
Total	100%	100%	100%
Total Stocks	Not Available	1.9%	2.5%
Preferred and Guaranteed Stocks	Not Available	1.4%	2.0%
Common Stocks	Not Available	.5%	.5%

Associated with this diversity has been the traditional observance of habitual conservatism in the selection of securities suitable for the investment of trust funds.

The properly administered investment department of a life company seeks to select, through exhaustive study and analysis, investments of a type which are not only satisfactory under fair weather conditions but also of such sound quality as to withstand the effects of business depression. It may properly be said that these studies are generally much more thorough and the selec-

tions are based on more complete information than are employed by or available to average individual investors most of whom appear inclined to classify investment securities too generally. Thus it is that to a great many people, all railroad bonds are in one class and if one performs badly, all others are considered equally bad. Such broad classification is of course fallacious and misleading. There are good railroad bonds and poor ones, just as there are good and poor bonds or investments of other types. Existing conditions have demonstrated that even in the case of corporations in receivership, some of their securities may be so well supported by earnings as to avoid default and remain undisturbed in reorganization. It is the ability to make discriminating selection, and to exercise eternal vigilance that builds quality and soundness into a life company's investment portfolio.

At the end of 1932 the total admitted assets of life companies reporting to the Life Presidents' Association will approximate \$19,000,000,000 as against \$16,000,000,000 in round numbers on December 31, 1929 for the same companies, a gain of \$3,000,000,000 during the depth of the depression.

These billions added in a period of uninterrupted economic stagnation are large enough to be impressive but appear even more important when considered in the light of the fact that these companies have increased their assets, in three depression years, an amount exceeding their entire asset worth at the end of 1906.

In the same three year period current revenues of the companies from premiums and interest and from investment instalments and maturities, have been in largest part sufficient, not only to meet the usual cash disbursements of normal times and the additional outgo for policy surrender values, but also to absorb enlarged demand for policy loans. It is definitely known that borrowing of life companies have not been, in number or volume, extensive enough to be of institutional importance.

Undoubtedly investment programs in the customary channels have been to some extent interrupted. Large sums have been disbursed to policyholders instead of invested but the moneys so disbursed have none the less passed into circulation even more quickly and by shorter routes than if retained by the companies and permanently invested and have served a useful purpose for the policyholders themselves. New investments have by no means entirely ceased however. In many cases accumulation of funds in excess of extraordinary demands upon them have caused

life companies to seek employment for such funds in the customary channels.

The magnificent record of life insurance in the depression period makes its invaluable position in the national economic structure appear more clearly than ever before.

INSURANCE PROTECTION

(Continued From Page 61)

mean that there are necessarily 55,000 insurance agents in the state, as in a great many cases a single agent will represent two or more insurance companies.

It is a matter of common knowledge that a remarkable increase in insurance underwriting—and this particularly applies to life insurance—has taken place in this country within the last few years, and attention has been called through the press to the fact that whereas it required 79 years to place fifty billion dollars of life insurance on the books of the various companies, it only required nine years to place a second fifty billion on the books. In Minnesota this increase is quite pronounced and is reflected in the records of premiums collected as well as the premium taxes paid to the state. For instance, in 1872 the total premiums on Minnesota business amounted to \$1,084,000; in 1916 to \$33,711,000, and in 1931 to \$112,643,143.46.

The statute imposes a tax upon insurance companies amounting to two per cent of the premiums collected within the state and this tax has naturally increased from year to year in proportion to the increase in premium collections. The premium taxes collected by Minnesota for the three years above mentioned were as follows:

1872	\$ 18,000.00
1916	510,823.00
1931	1,886,574.89

The insurance companies are also required to pay to the department various fees, for securing company and agency licenses, for examining reports, issuing certified copies of various documents, etc. The fees so paid to this department for the years just mentioned were as follows:

1872	\$ 1,102.00
1916	90,999.00
1931	151,176.99

No part of the insurance taxes received by the state is expended by this department. In fact, the fees paid by the companies for licenses and other purposes are sufficient to pay the cost of operating the department and still leave a balance of approximately \$100,000.00, which amount is used by the state for general purposes.

Mortality Trends*

T. A. Phillips

President, Minn. Mutual Life Ins. Co.
St. Paul

TRENDS in mortality are ordinarily slow to manifest themselves and still slower to reach their ultimate effect. This is a characteristic with which all statisticians are familiar and which serves to make them cautious in interpretation of early variations from what has been the normal. Frequently one trend may be superimposed on another, the two being of similar or of opposite effect, thus adding to the difficulties of proper interpretation. The inaccurate use of statistics is nowhere better illustrated than in the many erroneous and misleading statements made by laymen with respect to the betterment in general mortality and the increase in the so-called expectation of life. The latter especially has led to many fallacious impressions. Laymen frequently conclude that the progress so far made, indicates man has a better chance to survive to old age than his ancestors and the time is approaching when we may expect to live to 100 years. There is no statistical or scientific ground for such a statement. In spite of the fact that there are more people alive in the United States and a correspondingly greater number of deaths than ever, we find proportionately fewer deaths of 100 and over, than formerly. Death is the termination of a wearing-out process. All the evidence we have indicates that this process is accelerated today. The reason that the population as a whole averages a longer lifetime is, first, that we have a larger proportion of younger ages today than twenty years ago, and, second, that those under age 40 are less liable to early death than was the case twenty years ago. Hence it follows that we have more years of "young life" which in turn gives the appearance of more years of life in the general population. Actually, the span of life after age 45 has lengthened little, if any, and there is reason for believing that it is becoming shorter in our era instead of longer.

The following is a brief attempt to consider, first, certain bettering trends in mortality which have been recognized for some years past by medical and statistical authorities; second, by reference to cause of death, to make some deductions supporting or explaining these trends:

*Written especially for the Sixty-second Anniversary issue of The Journal-Lancet.

and third, to suggest evidences of the appearance at this time of a new trend superimposed on the one with which we are now familiar. Unless otherwise stated, references are to United States mortality.

Broadly speaking, there has been in the past twenty or more years a distinct improvement in the death rate to which most ages are subject. It is observed both in the general population and in that of insured lives. Its character may be stated generally as follows: The death rate for infants—say under five years of age—has been astonishingly reduced. The reduction for juveniles and young adults up to about age 35 is from 40 to 50 per cent. The reduction decreases thereafter until it practically disappears at ages 50 to 60, and ages over 65 show no substantial change, apparently having rested for several decades to about an irreducible minimum. Table I gives a picture of this movement:

TABLE I

RATES OF MORTALITY (Per 1,000)*				
(From U. S. Census Figures for Years Shown—Male Lives Only)				
Ages	1900	1910	1920	1930
Under 5	54.1	45.4	32.0	18.6
5-9	4.7	3.7	3.4	2.1
10-14	2.9	2.5	2.4	1.6
15-19	4.9	3.9	3.9	2.5
20-24	7.0	5.5	5.0	3.4
25-34	8.3	7.0	6.2	4.2
35-44	10.8	10.5	8.3	7.1
45-54	15.8	16.2	13.1	13.9
55-64	28.8	30.9	26.7	28.4
65-74	59.5	62.3	58.6	58.3
75 and Over	145.9	150.0	145.0	139.3

*Data for registration states of the 1900 Census, figures for the 1910, 1920, and 1930 Census having been adjusted to the corresponding registration area.

By reading the table across the page for each separate group of ages, the improvement in mortality which is shown for the major portion of the table can be readily noted.

A very similar trend is indicated from tables of mortality based on life insurance statistics as shown in Table II.

Coming now to a consideration of the causes of death, we find these statistics well supported both by the separate rates for cause of death and by our knowledge of what has been accomplished or failed of accomplishment in the field of Medicine. Seeking light for the very great improvement shown in the mortality of juvenile and young ages, we have merely to record facts

TABLE II

Age	(Death Rates Per 1,000 Lives)		
	(1) American Exposure Table (Yrs. 1843-1860*)	(2) Medico Actuarial Table (Yrs. 1885-1908*)	(3) American Men Table (Yrs. 1900-1915*)
20	7.8	4.5	3.9
30	8.4	4.9	4.5
40	9.8	5.7	5.8
50	13.8	10.6	11.6
60	26.7	24.0	26.7
70	62.0	61.7	61.5

*Years on which exposure is based.

which are known to all of us; viz., the conquering or control of the many diseases which took heavy toll at those ages, mainly communicable diseases, such as tuberculosis, diphtheria, typhoid, small pox, measles, scarlet fever, cholera, diarrheal diseases of childhood, etc. Too much credit for this can not be given to the medical profession and its brilliant accomplishments in those fields and to the various research, health and social agencies for the wide dissemination of information, looking to avoidance of these diseases.

In the upper ages of the tables, however, the improvement shown in mortality rates is relatively slight. Among medical men this is more or less commonly attributed to advancing rates of death from degenerative diseases—those diseases which attack middle and older ages—and seemingly have defied medical and scientific knowledge; namely, heart, arterial and kidney diseases, cancer, diabetes, mental diseases, suicide, etc. As will be suggested later, the full burden of this should not be laid on the shoulders of the medical profession. Some of it is attributable to other influences. The following table expresses numerically these various shifts in mortality by causes of death.

TABLE III

Cause of Death	DEATH RATES (Per 100,000) BY CAUSE OF DEATH*			
	1900	1910	1920	1930
Typhoid	35.9	23.5	7.8	4.8
Malaria	7.9	2.2	3.6	2.9
Measles	12.5	12.3	8.8	3.2
Scarlet Fever	10.2	11.6	4.6	1.9
Diphtheria	43.3	21.4	15.3	4.9
Tuberculosis (Respiratory)	181.8	139.7	100.6	64.6
Tuberculosis (Other)	20.1	20.6	13.4	6.9
Influenza and Pneumonia	181.5	115.1	153.4	68.4
Cancer	63.0	76.2	83.2	97.2
Diabetes	9.7	14.9	16.0	19.0
Cerebral Hemorrhage	71.5	75.8	81.9	81.0
Disease of Heart	132.1	158.8	159.1	213.5
Nephritis	89.0	99.0	89.2	90.8
Cirrhosis of Liver	12.9	13.9	7.1	7.2
Suicide	11.5	16.0	10.2	15.6
Homicide	2.1	5.9	7.1	9.0
Auto Accident .....	...	1.8	10.4	24.5

*From U. S. Census figures for registration areas corresponding to census of 1900, the data for 1910, 1920, and 1930 being adjusted to same registration areas as in 1910.

In the so-called uncontrolled group—using the word uncontrolled in the sense that medical science has achieved far less control here than has been done in the group of communicable

diseases—there are a few that are probably worth special comment.

Diseases of the heart and blood vessels head the list, approximately one-fourth of all deaths being due to these causes. The increase in death rates from heart disease within the ten years past has been close to 40 per cent as indicated by Census figures. Other statistics indicate a greater increase. The increase in death rate from diseases of the blood vessels is in practically the same proportion. Seemingly we die in our hearts and arteries especially if over 45 years of age.

Cancer shows a steady increase notwithstanding the improved treatment by surgery, X-ray and radium.

Diabetes, though not a major cause of death, continues its increase, the rate having doubled in 30 years and having increased 20 per cent in the past ten years, apparently uninfluenced by insulin—one of the most brilliant of modern advances. Doubtless the full ameliorating benefit of insulin is not realized. Deterrents are its cost, necessity of administration by hypo, supervision over long periods including blood sugar, and other expensive tests, and probably also the sense of security instilled, which leads to carelessness in maintaining diet.

Suicide and Homicide. The increases here are far from encouraging. They have continued through the past year. Some of the current increase undoubtedly is accounted for by the present business depression.

Automobile Accidents. The rates for these show a discouraging increase in the past decade to two and one-half times their 1920 level. It might be noted that the death rate for this shown in the above table does not include deaths in which any form of conveyance was involved other than automobile; for example, automobile and train collisions are eliminated. It is illuminating to note a decrease of 12 per cent in the case of motor buses and 35 per cent for taxies, a strong indication that the safety efforts made by these industries is probably bearing fruit. It is noteworthy that deaths from accident in the case of private-owned vehicles showed an increase of 50 per cent. Street lighting seems to be an important factor. Investigations by casualty insurance companies show that the period from 5:00 to 8:00 P. M., in which visibility is low, is the most fatal period in forty-six American cities. Strangely enough, the summer months show less accidents than the winter in spite of the fact that summer traffic is heavier.

It is frequently stated that medical science

has failed to make the forward strides in the treatment of degenerative diseases that have been made in other parts of the medical field. It is recognized, however, that other influences enter; for example, more accurate and earlier diagnoses, better statistical methods and records, the fact that more people are surviving to ages where these diseases manifest themselves, present modes of living, high speed and its resulting tension and wear; the war and post-war influence, the current business depression, etc.

With respect to the probable effects of the current business depression on general mortality, we find a variety of opinions. It is asserted that certain physical weaknesses will later develop because of under-nutrition and because of the adverse mental effects following poverty, worry and human misery. It is somewhat early, however, at this date to make such a prediction. So far as we have gone, the percentage of people unemployed is proportionately small. The most serious mental effects fall on those who are long unemployed with family responsibilities and those who lose their capital and savings. It is too early yet to measure these. So far the great majority of our population is not seriously affected and it is living more soberly, eating more moderately and probably using less alcohol. Counteracting influences are extensive and for the present, at least, I would prefer to take the optimistic view that over the broad general body of our citizenry, the helpful influences will about counterbalance the others.

There is still another explanation for the increase in death rates from cancer, heart and arterial diseases, etc. As pointed out above, fewer people die young. The difference in numbers is considerable. They must die later of some cause. Probably their lives terminate during middle and older ages by those causes of death which are now showing an increase. There is some statistical relation between decreased death rates from one set of causes and increased rates from other causes.

This brings us to the point where we may consider whether or not a new trend in mortality rate is now discernible, viz., an increase in death rates at about ages 50 to 60. Consider, first, the death rates appearing in the following table, which is a part of Tables I and II, respectively.

Ages	Census 1920	Census 1930
45-54	13.1	13.9
55-64	26.7	28.4
	Medico Actuarial (1882-1908)	American Men (1900-1915)
50	10.6	11.6
60	24.0	26.7

In each of the more recent experiences, the death rates have increased over the rates shown by the earlier experience for these particular ages. The mortality rate at these ages in the 1930 census shows a significant increase over that for 1920. The experience of insured lives for 1900 to 1915 shows a similar increase over that for the period ending 1908. In a joint study recently completed by a group of companies, there is a strong indication of a continuance of this tendency. Death rates for these ages seem to have increased within the past decade above those prevailing prior to that time. Roughly speaking, it affects ages from just below 50 to just above 60. The suggestion is made that we may be entering upon a new trend with respect to this group of ages, and that on the decreasing trend which has run since about 1900 we may be now superimposing a new and increasing trend centering around age 55. To a considerable extent, some of the general reasoning stated above tends to support this view. We have seen during the past twenty odd years that many additional lives are now brought into the period of adolescent and young adult life. These must later exit through those forms of death which have their onset in middle and older life. If there is anything to the theory that increased survival among the very young ages increases the proportion of persons with less physical vigor, we should expect some of these to wear out somewhat sooner,—in the 50's rather than in the 60's or later. Undoubtedly a very strong influence tending to accelerate the wearing-out process is found in the present pace of living. It seems quite probable that persons of 45 years and up may expect to live a briefer span of years than was enjoyed by their parents.

That methods of living, environment, mental and recreational pursuits have a tremendous influence on longevity is very well illustrated by the fact that the people of New Zealand, who, for the most part, live an agricultural pastoral life, enjoy an expectation of life some seven years greater than is enjoyed by the people of our population. With us, leisure seems a thing of the past. Even our physical movements are hurried—fast autos, fast trains, faster airplanes, speed in physical and mental actions serve only to accelerate the normal aging process. For example, railroad engineers show a high rate of heart and arterial disease. The man who prides himself on always "getting there first" should realize that he is making an early reservation for his passage to the next world.

Medical aid in its broadest sense may well

(Continued on Page 68)

The Estimation of Disability*

Arthur A. Zierold, M.D.
Minneapolis

DURING the past twenty years, there has been developing a phase of medical practice which has only very recently received formal recognition. For want of a better term it may be identified under the broad general head of Industrial Surgery.

In theory this phase of medicine differs not at all from the older classical conception but in practice it presents numerous and formidable complications. Of these, the most notable is the estimation of disability following injury. Before the advent of industrial insurance the patient consulted his doctor to be healed of his hurts with the tacit understanding by both that this should consume the shortest possible time; the duration of disability and the degree of ultimate recovery being considered in terms of individual misfortune. Today, because of the various forms of insurance in force, it is not alone necessary to heal the injury but to make careful and accurate estimate of the injury in terms of temporary or permanent disability, for upon such estimate is determined the monetary return due the patient for interruption of his effort to gain a livelihood. Herein lies the first element of difficulty for the doctor. The majority of cases presenting for examination are simple, and can be promptly disposed of to the complete satisfaction of all parties concerned, viz., the patient, the employer, the insuror, and the doctor himself; but there remains a minority which by reason of misrepresentation, misinterpretation or confusion of the facts on the part of one or all of the interested parties, gives rise to ill feeling and recrimination; all of which does little to maintain the dignity of the medical profession or its reputation for competence and integrity. Much of this might be avoided were the doctor to consider carefully his position in this scheme of practice, and to determine the limits of his function.

In the event of injury to a patient or during the healing period or at its termination, it is necessary to report the circumstance and any potential or actual disability. The Workmen's Compensation Act of the State of Minnesota provides and specifies compensation to the injured workman for such temporary or permanent

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disability as he may incur in the course of his employment. It is flexible and comprehensive and apparently conceived for the best interest and broad protection of the employee. That its scope and limitations are appreciated and quite accurately gauged by the insuror who contracts to protect the employer, is reflected in the rate of premium. Under such circumstances, with the rights of all parties adequately and justly secured, no necessity exists for the doctor to ally himself with either participant to insure justice being done. The first principle of practice continually to be recalled by the doctor is that whatever his personal opinion may be of the social justice of the compensation act, the moral integrity of insurance companies, or the testamentary delinquencies of workmen in general, he best serves the interest of whosoever retains him, be it employer, employee, or insuror, by reporting the facts in terms of the existing regulations. In short, his position should be that of a trained and dispassionate observer whose chief concern is the accuracy and reliability of his professional opinion.

The relation of accident to injury is in most instances the simple logical one of cause and effect, but there occurs a sufficient number in which this relationship is questionable; in which it is not at all clear that a specified accident may have given rise to the injury for which the patient claims compensation. Frequently the examining surgeon is confronted with a history of accident, and a complaint of disability supported only by a set of subjective symptoms which cannot be satisfactorily explained on a known physical basis. Again, disability may be reported following an accident, the mechanism of which is manifestly insufficient to produce such a result: or a patient may present with a disability following accident in which the possible causal relationship must be admitted, but which unreasonably exceeds the bounds of probability. Such unusual combinations of facts and interpretation of facts are difficult to reconcile and are not readily susceptible to a definite rule but nevertheless demand some uniformity of treatment. I believe that it may be safely stated that any accident may be considered the cause of a given injury only when the relationship can be ex-

plained in a logical manner in terms of accepted scientific knowledge or when such relationship is a matter of common experience. Such conclusions as may be arrived at in this regard and such further judgments as may be made of the nature and degree of the patient's injury are dependent in part upon the patient's statement and it is frequently in his too ready belief or disbelief that the examining doctor assumes the role of an advocate.

The telling of the truth is not a matter of volition alone. At times it requires a highly discriminating intelligence. The contradictory or illogical assertions which a workman sometimes makes in the effort to describe his symptoms are not always an attempt to mislead. Unfortunately there is no standard by which the credibility of the patient's statement can be measured, and when confronted by complaint of disability, supported by subjective symptoms alone, or such objective ones as cannot be rationalized, the doctor too often discards whatever he has of knowledge and experience, and says in substance that this or that conclusion is sound because he believes the patient to be truthful or untruthful as the case may be.

Although the burden of proof of injury rests upon the patient, the veracity of his statement must be accepted until disproven. It is in the nature of this proof or disproof that much acrimonious debate arises. I believe that the existence, character and extent of a patient's disability should be warranted on purely medical grounds. The function of the doctor is to determine medical facts and should these be determined upon non-medical evidence or evidence procured from others, he at once exceeds his function and invites the charge of prejudice.

The estimation of permanent disability is much simplified by the scheduled provisions of the Compensation Act. When loss of members has occurred, loss in terms of compensation is definitely specified. This application of an arbitrary and artificial scale is practical, and in the main, satisfactory. The law recognizes no acquired or special functional ability, but requires that the percentage of disability be determined on the basis of normal function or common use of the part. Thus, the musician receives no greater compensation for the loss of a finger than does the common laborer. While loss of substance lends itself to estimation by measurement alone, other limitation of function, such as stiffness,

pain, anaesthesia or loss of power encounters new difficulties. It is possible to employ a scale whereby the range of motion of a part may be measured but on such data no formula which will be sufficiently simple and accurate can be constructed to compute the percentage loss of function. As there exists throughout the whole body mechanism reserve far in excess of normal physiologic demands, so do the limits of action of its mobile parts exceed the demand of useful ordinary work. Therefore, in making estimate of the degree of permanent disability which has followed injury, except in disturbances of the special senses, the basic standard need not be the extreme limits of normal physiologic function, but rather those of useful function.

Much discussion and argument, friendly and otherwise has arisen out of the foregoing phases of medical practice. Accusations of bias and even less polite sins are often heard. This man is spoken of as a representative of insurance companies, that one as an advocate for all employees and their estimates of disability are viewed with suspicion. As a result we all suffer in our relations with the public at large. In industrial medicine we are losing caste and it behooves each one to remember that he is not the representative of an insurance company or an employee, or an employer, but of the medical profession.

MORTALITY TRENDS

(Continued From Page 66)

include direction as to physical, mental, and moral hygiene. There is no one to whom the average man will listen more willingly or more receptively than to his family doctor on such matters. There is no one who, after possessing a sane philosophy of life, can better or more acceptably dispense his philosophy to his patients and friends. Our objective is not solely that of prolonged life; it is to retard or lessen the effects of disease so that in older years the brain may still be alert and the senses responsive to the pleasure of living. To prolong life is not worth the effort if bought at the cost of the joys of life. The more we ponder on why we die and how, the more we realize that an appreciation of the desirability of life prolongs our years. Perhaps it is in the mental and spiritual philosophies of life that our worthy medical profession will find a powerful ally in its fight to control these dreaded degenerative diseases.

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INSURANCE PHYSICIANS

Not only as a most important contributor to the success of the insurance ideal, but also as a potential creator of an insurance estate, the practicing physician deserves a clear understanding of the many medical and non-medical factors that go to make up the ubiquitous ramifications of the insurance structure. To present the insurance problems as it bears on the life and practice of the physician is the aim of this special Sixty-second Anniversary Number of the JOURNAL-LANCET.

In this issue are presented a number of papers representing important spokes in the insurance wheel. Better understanding and co-operation will arise from an exchange of ideas between the necessary insurance functionaries, from the president of the company, who must calculate general business conditions, to the practicing physician who wishes to arrive at a standard procedure in insurance examinations, which will enable him to gauge an individual risk fairly and accurately.

Insurance statistics are incalculably impressive.

Yet the problem of estimating the chances of the individual for longevity and good health must be left to the insurance examiner, the physician whose medical skill and experience enable him to make just prognoses in individual cases. Should medical examiners err grossly over a long period of time, the entire financial structure of insurance would topple.

IT IS AN ILL WIND THAT BLOWS NOBODY GOOD

The JOURNAL-LANCET during its sixty-two years of life has witnessed many important advances in the progress of medicine; the discovery of most of the pathogenic organisms, numerous advances in medicine and surgery, the development of preventive medicine, and the decline of many communicable diseases. During those sixty-two years there were regressions as well. Ultimate progress has even been stimulated by some of these regressions, such as the Spanish American and World Wars. The present financial situation, which involves all professions, classes and individuals, has by its magnitude forced a reconsideration of methods and means and even goals and ideals. The medical profession must pause, like the rest of the world, and consider where the methods of the past are leading.

In the ante-depression days money was easy to obtain. Physicians and hospitals often became too independent to serve the people as they should; the taxpayer thought little of how his money was spent. As a result large numbers of free clinics were established and much free institutionalization was begun; so much that we were rapidly heading toward the diagnosis and treatment of most all diseases at the expense of the taxpayer.

The criterions and conventions have entailed the attendance of physicians at free clinics. Today such clinics are operating in comparative luxury with poorly paid or unpaid physicians. As financial conditions have steadily grown worse and tax money scarcer, the realization that these free hospitals have been increased and free clinics expanded without heed of the taxpayer's money comes like a blow, both to their personnel and the public. Many of them have built so extensively that they already face the problem of securing enough tax-money for maintenance. The actual competition with the practice of private medicine is apparent. The depression is already threatening the future of such institutions. The tendency now is away from such building and such clinics, except those necessary for the teaching of nursing and medicine, and towards placing the patients in the hands of the practitioners of medicine.

Henry Vaughan of Detroit has demonstrated in a logical manner a method of controlling disease and rendering the public better service than it has ever had before. In his diphtheria campaign he enlisted the services from the offices of 1100 private practitioners of medicine; he abolished the free clinics; an educational campaign was waged by physicians, nurses, and the public. When the actual work began, families took their children to the office of the physicians. If they were able to pay the usual fee, they did so; if they were able to pay only a reduced fee, they did so; if they were unable to pay, the fee was paid by the Health Department. Thus, instead of having one health department general office with a dozen or more free clinics, Dr. Vaughan established 1100 clinics in private offices where far better service was rendered to the public than would have been possible in free clinics.

Stuart Pritchard of Battle Creek, director of the Kellogg Foundation, has had no difficulty in securing the co-operation of the practitioners of medicine and dentistry in the counties where he operates. The Foundation pays them for their services and in no way interferes with their private practice of medicine and dentistry.

Herbert Burns of the Minnesota State Sanatorium has already launched a plan whereby tuberculous patients sent to the sanatorium are returned to their family physicians at the earliest possible moment, consistent with the safety of the family. The physician's interest is maintained in the patient throughout the period of institutionalization. One of the excellent features of the entire plan is that patients are returned to their physicians with the understanding that such

physicians be compensated by the county commissioners at a much smaller expense to the taxpayer than would be possible if the patient were to remain in the sanatorium. No out-patient department is to be maintained. The private practitioners are capable of caring for ex-sanatorium patients in their offices. Thus, the office of every physician becomes a diagnostic and therapeutic clinic for tuberculosis in the true sense of the word. This plan in its essential parts has been in operation in some of our institutions, such as that operated by Sidney Slater, with the greatest of success for many years. The present tendency is to return the practice of medicine, diagnostic, therapeutic, and preventive, to physicians; by so doing, the public will be better protected in a much saner manner after the depression than it was formerly. Thus, it is an ill wind that blows nobody good.

J. A. M.

MEDICAL CARE COSTS

In order that one may understand the medical-care-cost report, it is necessary to remember that the same leaven that is responsible for the Soviet experiment pervades the political atmosphere of all the world, and the product of the fermentation differs only according to the culture medium exposed. Problems affecting medical practice have not escaped this pandemic of communism.

There remains but one hope for medical individualism and that lies in the young man who is active in practice. He must rise up and formulate an answer to these social theorists and super-annuated doctors of medicine who are not themselves to be touched by their proposed innovation. The minority report evidences a more youthful tempo.

God help the people, lay and professional, as this seething cauldron of social unrest continues its ominous rampage in our vaunted "land of the free and home of the brave."

A. E. H.

THEODORE N. KITTLESON, M.D.

Dr. Theodore N. Kittleson, for 30 years one of the outstanding physicians of Fergus Falls, Minn., died Tuesday, January 10, at St. Luke's hospital.

The doctor was taken ill with influenza the day after Christmas. Pneumonia developed and he was removed to the hospital. When his condition became grave, a specialist from Minneapolis was summoned, everything possible being done to prolong his life.

Dr. Kittleson was born in Worth county.

Iowa, March 21, 1874. A few years later, he came with his parents to Canby, Minn., where he was graduated from the public schools, after which he enrolled at the University of Minnesota. After completing the medical course at the University he came to Fergus Falls, and was associated with Drs. Cole and Drought for a number of years, the firm being known as Cole, Drought and Kittelson. Later he took post graduate work at Vienna, London, New York, St. Louis and New Orleans. He specialized in eye, ear, nose and throat ailments, and his ability, coupled with a strong personality, brought him an extensive practice.

In the passing of Dr. Kittelson, the state has lost an outstanding, upright citizen, a man whose friendship was highly valued by men, women and children in all walks of life. He did a great deal of charitable work. Hundreds of children, whose parents were unable to pay, have been fitted with glasses by Dr. Kittelson, without charge. These are facts known only to the doctor's intimate friends. He had hundreds of charity cases not only from Otter Tail county, but from all the surrounding counties.

The doctor was an extensive traveler. Several years ago he made a trip around the world, and in late years he always made a winter trip to either California or Florida. He was planning a trip to Florida just as he was taken ill.

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. Matthew Eich of Minneapolis is not, and never has been connected with the Star of Hope Hospice of Minneapolis, as reported through an error in our advertising columns in a recent issue of THE JOURNAL-LANCET.

Dr. F. F. Lang, Hettinger, N. D., died suddenly at his home on January 14 at the age of 48 years.

Dr. V. W. Carlson, who has been in practice for a short time at Wells, Minn., is now located at Blooming Prairie, Minn.

Dr. R. J. Stein, formerly located at Graceville, Minn., has moved to Cold Springs, where he will continue general practice.

Dr. F. H. Magney, Duluth, has been appointed a member of the Minnesota Medical Examiners Board for a term of seven years.

Dr. J. A. Thabes, Sr., Brainerd, has been named by Governor Olson as a member of the Minnesota State Board of Health.

Dr. O. M. Porter, Sisseton, S. D., has been appointed examiner for the Veterans Administration to cover that section of the state.

Dr. W. F. Braasch, of the Mayo Clinic, was a guest speaker at a meeting of the members of the San Antonio, Texas, Medical Society.

Dr. Frederick A. Brandt, who has been in active practice at Sturgis, S. D., for the past 30 years, died last month from a heart attack.

Dr. R. H. Sweetman, a prominent physician of Sauk Center, Minn., was called by death on January 14, from the effects of pneumonia.

Dr. H. D. Sewell, Huron, S. D., was re-elected president of the District Medical Society at the annual meeting recently held in that city.

Dr. Frank Naegeli, Fergus Falls, Minn., was united in marriage to Mrs. Martha Nordby, Argusville, N. D., the ceremony taking place on January 1.

Dr. George E. Johnson, formerly in practice at Avon, Minn., is now located at Yankton, S. D., and will be associated with Dr. E. M. Moorhouse.

St. Michael's Hospital, Grand Forks, N. D., celebrated their twenty-fifth anniversary last month. Thirty physicians were present as guests at the dinner.

Dr. W. H. Gilsdorf, who has been associated with the Dickinson Clinic for the past few years, will open offices for general practice at New England, N. D.

Dr. M. S. Henderson, Rochester, Minn., was one of the leading speakers at the annual meeting of the American Academy of Orthopedic, recently held at Chicago.

Dr. T. N. Kittelson, who, for the past 30 years, was one of the leading physicians of Fergus Falls, Minn., died on January 10, after a short illness of pneumonia.

Dr. H. C. Durkee, Faith, S. D., has cancelled \$30,000 of his old patients' accounts to start the new year. Dr. Durkee has been in active practice in Faith for over 20 years.

Dr. A. S. Hamilton, Minneapolis, Minn., a specialist in mental diseases, was in Fargo last

month, being summoned there as an expert witness in an important suit being tried in court.

Dr. B. V. McCabe, a prominent physician of Helena, Mont., was recently married to Miss Lucy Flinn of that city, the ceremony taking place at the Cathedral, intimate friends only being present.

Dr. H. J. Fortin, Fargo, N. D., was recently married to Mrs. Adele Hayden, of that city. Dr. Fortin has opened offices for general practice at Fargo, after an absence of several years at the Mayo Clinic, Rochester.

The Western Medical Society held their annual meeting at Missoula, Mont., last month and named the following officers: Dr. W. N. King, president; Dr. A. T. Hass, vice president, and Dr. J. D. Hobson, secretary.

Dr. E. B. Crosby, Valley City, N. D., died on January 7 after a brief illness, at the age of 52 years. Dr. Crosby was born in North Dakota, and for the past 25 years had been in active practice at either Oriska or Valley City.

The Mower County Medical Society held their annual meeting at Austin, Minn., and elected the following officers: Dr. J. G. W. Havens, president; Dr. W. B. Grise, vice president; Dr. P. A. Robertson, secretary, and Dr. A. E. Henslin, treasurer.

Dr. Fannie Dunn Quain, Bismarck, N. D., was re-elected president of the North Dakota Tuberculosis Association, at their recent annual meeting. This association is doing grand work in all sections of the state, especially the fresh air work for children at Camp Grassick.

License to practice medicine in North Dakota has recently been granted by Dr. G. M. Williamson, secretary of the State Board of Examiners, to the following: Drs. M. F. Williams, Hettinger; C. O. Haugen, Grand Forks; P. E. G. Hooper, Williston, and J. A. Cowan, Flaxton.

At the January meeting of the Minnesota Pathological Society held last month at the University of Minnesota, papers were presented on: "Life History of Gastric Ulcer as Observed Roentgenographically," by Dr. Russell W. Morse, and "Benign Tumors of the Stomach," by Drs. L. G. Rigler and L. G. Erickson.

Dr. H. L. Huffington was named president of the Blue Earth County Medical Society at the annual meeting held at Mankato last month. Other officers are: Dr. M. I. Howard, vice-president; Dr. A. J. Wentworth, secretary-treasurer.

The women's auxiliary met at the same time and elected: Mrs. H. L. Huffington, president; Mrs. W. C. Stillwell, vice-president; Mrs. G. A. Dahl, treasurer; Mrs. R. G. Hassett, secretary.

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 1, "Cardiac Neurosis"; February 8, "The Cause of Backache"; February 15, "After the Gallbladder Is Removed"; February 22, "Cancer of the Stomach."

The annual meeting of the Sioux Valley Eye and Ear Academy was held on January 24 at Sioux City, Iowa, with a good attendance and a very interesting program being presented. Dr. J. B. Gregg, Sioux Falls, S. D., is president, and Dr. F. H. Roost, Sioux City, Iowa, secretary. Program: "Personal Experiences on Cataract Work in India," Dr. Eugene C. Foote, Hastings, Neb.; "Care of Glaucoma," Dr. Abbott M. Dean, Council Bluffs, Iowa; "Unreal Phenomena and Their Relations to Auditory Tests," Dr. A. G. Pohlman, Dean of School of Medicine, University of South Dakota; "Thrombophlebitis of the Lateral Sinus," Dr. C. E. Robbins, Pierre Clinic, Pierre, S. D.; "Notes on Oriental and Spanish Eye Clinics with Movies," Dr. J. J. Hompes, Lincoln, Neb.

The Judge of the District Court of Hennepin County has made an order sustaining the demurrer interposed by the State Board of Medical Examiners in the action instituted by Granger against the Medical Board in August, 1932, whereby Granger sought to enjoin the Board by injunction from interfering with the conduct of his health audit business. Granger alleged in his complaint that for the past seventeen years he had been engaged in the health audit business, which business consisted of "Four periodical urinalyses during the period of a year, with additional urinalyses where determined necessary. Plaintiff also extends to his subscribers one blood pressure test per year and additional tests if the same seem necessary and desirable." Granger conducted his business by employing a licensed physician in Minneapolis to make the urinalyses. It was the contention of the plaintiff that he had a business that was bringing in, in the neighborhood of \$11,000

to \$12,000 per year. On August 24, last, he instituted his action to restrain the members of the State Board of Medical Examiners from in any way interfering with his business. It was the contention of the Medical Board in the District Court that Granger was unlawfully engaged in the practice of healing, Granger not being licensed to practice medicine nor registered under the Basic Science Law. It was also the contention of the Board that the Board could not be enjoined from taking the necessary steps to put an end to the conduct of such a business by an unlicensed layman. The Judge stated in his order that Mr. Granger had not stated a cause of action against the Medical Board. Counsel for the plaintiff have announced that they will appeal to the Supreme Court of Minnesota from this decision.

A call for every available scientific film of interest has been issued by the Committee on Scientific Assembly of the Minnesota State Medical Association. These films are to be used for the 80th Annual Meeting of the society to be held at Rochester, Minn., May 22, 23, and 24. Eighteen films, most of them new, already comprise the Scientific Cinema in preparation for the meeting. Following the precedent set in St. Paul last year a series of small group table demonstrations will be a very important feature of the meeting. These demonstrations will be given for one hour each day in the same halls that house the scientific and technical exhibits. A large and varied number of exhibits of both types are under preparation, with a prospect that the number of individual contributors would exceed that of all other years. The medal offered annually by the Southern Minnesota Medical Society for the best scientific exhibit submitted by an individual will be offered again this year. Prominent among other novel program features are the open meetings of the special societies to be held all day Monday. These meetings will provide important programs in surgery, dermatology, obstetrics, tuberculosis (by the Trudeau Society), heart, orthopedics, eye and ear, and X-ray. Among symposia of interest now being arranged for Tuesday and Wednesday is one on nutrition, another on surgery, and another on cancer. Clinics to be held in Rochester hospitals will occupy Tuesday and Wednesday afternoons. Forty of these are already scheduled. The usual social events, golf tournaments, luncheon reunions, and banquet, together with various special tours will complete the three days' program.

The District Court, of Minneapolis, sentenced Philip Mueller to a term of ten to forty years in the State Prison at Stillwater for manslaughter in the first degree. The penalty for manslaughter in the first degree is five to twenty years, but Mueller having a prior conviction for the same offense in 1912 was sentenced under the habitual criminal act to a double penalty. Mueller, seventy-one years of age, had his license to practice medicine revoked by the Minnesota State Board of Medical Examiners in 1930 because of his habitual indulgence in the use of morphine. Mueller continued to violate the law by maintaining an office in Minneapolis, where a sign on the door read "Dr. Philip Mueller, Medician."

BOOK NOTICE

AN INTRODUCTION TO DERMATOLOGY, by Richard L. Sutton, M.D., and Richard L. Sutton, Jr., M.D. With 183 illustrations. St. Louis, C. V. Mosby Co., 1932. Price, \$5.00.

A good little book, new and up-to-date, and very well written. This small volume of 565 pages is written for the student and is not meant as a reference book and so does not have a lot of references filling up space, but is all descriptive and very concise. It has a wealth of good illustrations and will make a valuable book for the beginner.

S. E. S.

MATERIA MEDICA, PHARMACOLOGY, THERAPEUTICS AND PRESCRIPTION WRITING FOR STUDENTS AND PRACTITIONERS, by Walter A. Bastedo, Ph.G., M.D., Sc.D., F.A.C.P., Asst. Clinical Prof. of Medicine, Columbia University; Consulting Physician, St. Luke's Hospital, New York; St. Vincent's Hospital, Staten Island, and the Staten Island Hospital; President, U. S. Pharmacopoeial Convention, 1930-1940; Member Revision Committee, U. S. Pharmacopoeia, etc. Third Edition, W. B. Saunders Co., Philadelphia, Pa., 1932. Price, \$6.50.

In this edition, as in previous ones, the author has continued to emphasize established laboratory and clinical facts of practical importance to the practicing physician. The extensive recent researches in the medical sciences have made necessary an almost complete rewriting of the book. New chapters have been added on a number of new remedies that have attained therapeutic interest, such as: suprarenal cortex, ephedrine, quinidine, plasmochin, yaten, ethylene, the barbiturates, pre-anesthetic narcotics, carbon dioxide, carbon tetrachloride, the antiseptic dyes, mercurochrome, metaphen, the mercury diuretics, phenylhydrazine, insulin, etc. All of the 739 pages contain up-to-date, authentic, well arranged, practical information for the student and practitioner of medicine.

A. W. DAHLSTROM, M.D.

A. W. D.

BIOPSY IN MAMMARY CANCER*

The extent and severity of the radical operation for mammary cancer calls for a positive diagnosis in every case. Since women are now coming earlier for diagnosis of mammary disease, and often before the characteristic clinical symptoms of established cancer have developed, the diagnosis of these conditions has become more difficult and biopsies are more frequently required.

There is a difference of opinion regarding the best method of performing the operation for a biopsy of the breast. Some surgeons prefer to cut directly into the tumor, make the diagnosis on the gross appearance which is usually specific, or cut out a piece of the tumor for frozen section. If the tumor proves to be cancer, the wound is closed over a sponge soaked in 10% formalin. They then discard the instruments and gloves used in the exploration, prepare the skin anew, and proceed with the operation indicated. This is a very direct and expeditious method. It avoids much trauma inevitable in a local excision which requires cutting on all sides of the tumor nodule. In the case of bulky tumors it may be the best method.

There are some lesions in the breast in which it is difficult for any surgeon or pathologist to state positively whether the condition is malignant or benign. Hence the surgeon must not assume that by obtaining a microscopic diagnosis he has secured positive information. In such cases the clinical data, age of patient, extent and duration of the disease, condition of lymph nodes, and especially the gross characters of the lesion should be given much importance in the decision. Under these circumstances some surgeons would err on the side of caution and perform the radical operation. I believe it is unfair to the patient to perform a radical mastectomy unless the diagnosis of carcinoma is positive. There are many precancerous and suspicious lesions in the breast which are clinically benign, while a true carcinoma is nearly always obvious to a pathologist of adequate experience. When a substantial doubt exists about the nature of a microscopic section of a breast tumor, it is generally not cancer.

JAMES EWING, M.D.

*The American Society for the Control of Cancer, New York, N. Y. From the Bulletin, January, 1933.

CLASSIFIED ADVERTISEMENTS

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A portable X-ray apparatus in good condition. Describe fully and state price. Address Box 953, care of this office.

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South Dakota town of 500. Good territory. Former doctor deceased. Heated office available, rent cheap. Investigate at once. J. C. Eng, Vienna, S. D.

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An experienced M. D. desires a position as assistant to a surgeon and general practitioner in Minnesota. Competent to do refraction work also. Address Box 954, care of this office.

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Experienced young lady wishes position as doctor's assistant. Can do shorthand, typing, and bookkeeping; also, some laboratory experience. Caroline Rose, 1511 Thomas Ave. No. Cherry 0972.

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Up-to-the-minute doctor's office in new medical building in finest business section of good residential district. Chance to associate with other prominent doctors. Box 956, care of this office.

PRACTICE FOR SALE

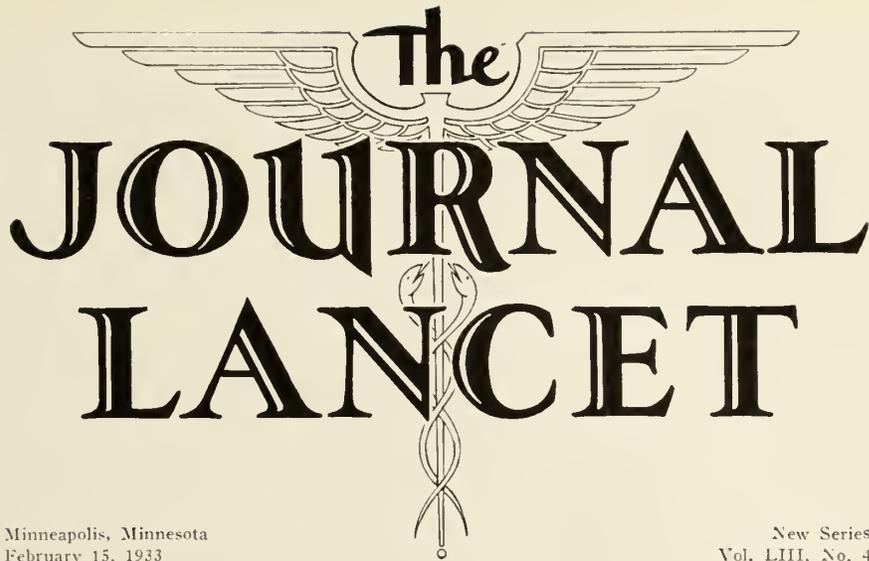
Will sell general practice complete in good farming community of southwestern Minnesota at a bargain. Equipment is all practically new. Share waiting room with dentist. Office in good condition, steam heat, low rent. Practically no opposition. Am going to specialize. Address Box 945, care of this office.

PRACTICE FOR SALE

Good practice in live town in southeastern North Dakota, population 1,800. No bank failures, good farming community, population mostly German and Norwegian. Good roads. One other doctor in town. Will sell for price of equipment. Reason for selling, going to specialize. Address Box 955, care of this office.

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This is a fine outfit that some one can have cheap. One complete X-ray equipment consisting of: One practically new late model Acme 6:60 Transformer with controls. 220-volt, 60-cycle current; one combination horizontal and vertical radiographic and fluoroscopic Victor Table equipped to do stereo work; one Universal X-ray Timer, 110-volt, 60-cycle current; one complete Dark Room equipment consisting of Tank and modern accessories. Address Box 950, care of this office.



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The Program of the Minnesota State Sanatorium*

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Ah-Gwah-Ching, Minn.

THE Minnesota State Sanatorium as all sanatoria must have a program as well as a routine; it must have an objective that extends far out beyond the range of clinical and therapeutic responsibilities to justify the purpose for which it was originally created and since maintained. Such a program to be satisfactory, must serve community needs as well as individual relief. The tuberculosis sanatorium in its relation to tuberculosis control must be considered from two points of view—its usefulness in caring for the sick in the institution itself, and its preventive activities in the community. The sanatorium serves a dual purpose, both of which are essential to the successful administration of the tuberculosis problem.

Minnesota is fortunate in having a rather complete sanatorium system, both county and state. Each institution is performing a valuable service; each has developed its own program, which is being applied to the community in which the institution is located. Fourteen county sanatoria serve forty-one counties, and the State Sanatorium serves forty-six counties, which have not availed themselves of the sanatorium law. Because of its isolated position in the tuberculosis program of the state and the large territory dependent upon it for the care of its tuberculous, the State Sanatorium has developed a program applicable to its particular requirements. This program is based

*Read at the State Health Officers' Conference, Huron, S. D., October 4, 1932.

upon the theory that a public sanatorium must be founded upon a modern conception of tuberculosis control, rather than being limited to therapeutic relief. This theory, if it may be so called, is none other than that of contagious disease control as applicable now to the control of tuberculosis as a dangerous disease, as it was but a few years back in the control of typhoid fever, diphtheria, scarlet fever, yellow fever or plague. The tax supported sanatorium must serve for purposes of control in its particular territory else fail to properly evaluate itself in this field of preventive medicine. The sanatorium rests upon a tripod of public service, isolation and treatment of the clinical case in the institution and epidemiological investigation and control of tuberculosis in the field. The institutional phase is one affecting the patient only after admission; to remain a problem of internal administration and affecting the community through the blocking of a potential source. Since the Sanatorium comes in contact with all the physicians, public officials and agencies interested in tuberculosis control in the territory served, it must establish relationships with these various groups of citizens making the maximum co-operative effort possible.

The patient entering the sanatorium accepts the treatment and supervision established for his benefit. The institution accepts the theory of contagion in the spread of tuberculosis and puts into

practice certain procedures whose purpose it is to protect the positive sputum case from contacting others who might suffer as a result of such association. Patients entering, unless they are clinical cases with positive X-ray and sputum, are kept in separate quarters until they can be accurately classified. All positive sputum cases are divided into two groups—those with active disease showing both progressive and retrogressive lesions, and those whose tuberculosis has become chronic and stationary. The one group requires infirmary care, while the other is in need of a sheltered environment over a long period of time. Such patients are frequently fully ambulant and able to care for themselves in many ways, even to engage to some extent in remunerative employment. In this group is found the carrier, who, while feeling well, if not properly trained and supervised, is able to continue associations with susceptible contacts until the transfer of the tubercle bacilli has been effected.

Tuberculosis in the Sanatorium is divided into two classes upon which routine depends—the active and recessive groups. All cases are considered active until they have over a period of six months demonstrated consistently negative sputum with X-ray evidence of a healing lesion. Pulmonary sputum is examined at least once each month. During the last six weeks of this period sputum is examined once each week, one specimen being a twenty-four hour concentrated test from certified sputum. In addition to the sputum findings, the X-rays must show evidence of a resolving lesion without cavity before the active and positive sputum case can progress into the recessive class.

Institutional activities are frequently duplicated because of this grouping based upon the sputum and X-ray classification. The library, for instance, is divided for the two groups. Entertainment, especially during the winter months, is encouraged separately in these two groups, while outside parties are frequently combined.

There are two main dining rooms, one arranged for the active cases, the other is used by the recessive cases and the employes. Dishes from the infirmary cases go with the dishes from the active case dining room for sterilization and washing. In the dining room occupied by the employes and the recessive group, the patients use one design of china and the employes another. The menu in the two dining rooms does not vary, although there is much variation in the menu for the tray patients. Much time is given by the dietitian to the toxic, terminal and gastro intestinal cases. Each presents individual problems for the

dietitian, nurses and doctors, and each is given serious study. Each patient accepts institutional care for two major reasons, in hopes of gaining early recovery through its assistance, and to protect the family who would be otherwise exposed through unnecessary association.

All employes are examined, have X-ray films made, and given skin tests when employment begins, and thereafter as indicated (nurses at least every four months; other help every six months, or as indicated). A contagious technique is established and is being carried out in all departments of the institution so far as the active and positive sputum case is concerned.

The return home of the convalescent patient has always presented difficulties, which, so far as we have been able to determine, still remains unsolved. The sanatorium has always tried to train patients, yet the single fundamental act of having routine sputum examinations usually is the exception rather than the rule among those discharged from sanatorium care. Periodic reports of patients while on the cure, are sent to the county officials, and clinical reports, together with X-ray plates, when indicated, are sent to the family doctor. *It is the plan of the Minnesota State Sanatorium to co-operate to the fullest extent with the family doctor, realizing that he is the only successful case finder and that the responsibility for after care and guidance must continue to rest with him.*

Tuberculosis as a disease of mankind does not require specialization in medicine in order to insure proper care for the afflicted, but it does require the attention, interest and participation of the entire medical profession. There has been much discussion concerning the necessary number of beds for the tuberculous. Tables have been devised in order to make it possible for any group to determine at once the necessary size of their proposed sanatorium. We have inventoried our capacity and squared it with the community served. By discharging the recessive group, including those on collapse therapy, to the family doctor, we can care for at least twice as many patients as we now have in the institution. The county to which favorable cases are returned, must authorize the family physician, on the sanatorium's recommendations, to check on the patient once a month, collecting sputum and giving general supervision relative to hygiene, prophylaxis, etc. The family physician will then render the necessary supervision at home for a patient during a period heretofore spent in the sanatorium. Many patients' residence can be cut down by six months, if a portion of the work and care now

obtained in the sanatorium can be taken over by the family doctor. In addition to the valuable work he has done in case finding as well as aiding in getting his patients admitted to the sanatorium, he will save a considerable sum to the county, and at the same time add to his own income. He will in addition make it unnecessary for the state to consider further sanatorium construction a necessary part of its future anti-tuberculosis equipment. There is no logical purpose served in the housing of the recessive case. With medical supervision as outlined there is no health problem involved, hence, no public responsibility to be considered except the practice by the county on the Sanatorium's recommendation of paying the family physician for the home supervision of this group of cases.

An important feature to be developed, is the working out of the administrative machinery necessary to provide sanatorium care for the positive sputum case without delay, returning properly authorized, the recessive group to the care of the family doctor. Work done so far in promoting mutual confidence as well as providing the necessary equipment for co-operative effort among the three groups—the county officials, the sanatorium personnel, and the family physician—has given most encouraging results.

In the development of our program at the Minnesota State Sanatorium many features which have been considered essential in other institutions, have been modified or eliminated. Surgery, always an expensive and difficult activity to keep up in a small institution, is not attempted, except in emergency work and collapse therapy. We have a very successful relationship with the University Hospital, where all of our surgical cases are cared for. While we have an operating room with practical equipment, we do not plan on making surgery an important activity.

The public sanatorium must serve a purpose different from that of the private one, since the one is wholly a clinical institution, while the other must make disease control an important part of its objective, else fail in properly appreciating the purpose for which it was created. Research does not properly belong to our institution. With the routine work carried on an abundance of data is accumulated, all of which is accessible for study and analysis. The staff physicians have access to such data for study. The digestion of this material is as stimulating and of more practical value than any amount of research that could be carried out under the restricted conditions in the sanatorium. Each doctor is expected to work out some problem concerning tuberculosis, at least

once a year. Tuberculosis control is given important emphasis in the program of the physicians, nurses and attendants. The employment of an epidemiologist on the staff has been of tremendous importance in the development of our present program. This staff member is in the field continuously as a liaison officer between the institution and the community. He visits all the family physicians, helping them in their various tuberculosis problems, the county officials assisting them in getting patients diagnosed and hospitalized, and frequently discharged from the Sanatorium and placed under proper medical supervision at home. He works with the school authorities, health officials, county and state nurses, and other anti-tuberculosis organizations. One of his most important duties is to bring the problems and difficulties of the county officials and physicians in the field to the staff at the Sanatorium.

The field work accomplished by the epidemiologist depends upon many circumstances. Whenever he can be of use in tuberculosis control he loans himself for this purpose, whether it is a diagnostic problem in an individual case or a survey involving several thousand. Much time and effort was spent during the past year working with other agencies in the study of tuberculosis among the Indians in Minnesota.*

The program of the State Sanatorium is sufficiently elastic to adapt itself to any phase of tuberculosis control in the forty-six counties served. The epidemiological work with the Indians indicates the scope of the work carried on outside of the institutional routine, yet they are all considered essential elements to the Sanatorium program.

The Minnesota State Sanatorium is an institution serving a dual purpose. First, it must serve the individual by rendering first aid to those already suffering with clinical tuberculosis. Secondly, it must function to the end that the public is protected against an unnecessary communicable disease. The giving of relief has been one phase of Sanatorium work, monopolizing to a large extent time and energy of the medical staff in the past. This has resulted in an unnecessary and undesirable conflict between the Sanatorium and the family doctor, which is not only undesirable, but impedes our controlling efforts and limits the usefulness of the Sanatorium to its being solely a relief station. *For this reason we are co-operating with the family doctor returning to him what is rightfully his, expecting in return for this only those cases whose presence in the home threatens others with exposure*

(Continued on Page 87)

The Evaluation of Modern Diagnostic and Therapeutic Measures in Chest Disease*

Geoffrey I. W. Cottam, M.D.
Sioux Falls, S. D.

PART I

IN ALL chest disease there are certain general rules of procedure. For instance, when sputum is present, a complete microscopic study of every case is advisable but equally important is the recording of the amount of the twenty-four hour output. When no sputum is present, expectorant drugs may be used to advantage. The collaboration of the surgeon, internist, bronchoscopist and roentgenologist is advisable. Each of the following subjects will be as free as possible from detail but it is hoped none of the major points will be slighted.

Frequently, the chest diagnostician is called upon to diagnose some obscure chest pathology. Often times these conditions are in post-operative cases.

SEE PLATES 1 AND 2

Massive Collapse—A review of thirteen cases seen by the author, reveals the following data. The etiology apparently is related to limitation of respiratory movement and excessive sticky bronchial secretion in the capillary bronchi with the subsequent alveolar imprisonment and absorption of air. Pneumococci are usually predominant in the sputum. The neurogenic theory has not borne out since the condition results when bronchial antispasmodics have been given pre-operatively and post-operatively. Massive collapse occurs after any anesthetic, even local, but more particularly follows general anaesthesia. Poor breathers are more prone to develop this condition. Partial collapse probably follows every abdominal or chest operation to a greater or lesser degree. The occasional occurrence of partial collapse in unoperated cases has often been noted. This is particularly true in bronchiectasis but probably is a sequela of the bronchiectasis. Lipiodal injections of collapsed lungs do not show any degree of bronchiectasis unless it was present before operation. J. R. Head injected lipiodal in a case of this condition. The usual time of occurrence post-operatively, is about twelve hours after operation although it does occur as early as six hours or as late as twenty-four hours post-operatively; it is the most common lung condition that comes *early*

*Read before the Staff of Lymanhurst School of Tuberculosis at Minneapolis, Minn.

in the post-operative course. When bilateral, it may be fatal but it is usually unilateral and on the side of the operative incision.

The pathological study shows collapsed alveoli and thick secretion in the finer bronchi.

The symptoms are very definite. It comes on early in the post-operative course as explained, and this is important to note. Sudden sharp pain and dyspnea are the initial symptoms. A few hours later a productive cough and fever develops. The pain in the chest is often referred in the lumbar region or toward the hip joint and these areas may be complained of severely. On examination, the mediastinum is usually found displaced toward the affected side. This mediastinal displacement may be temporary or remain throughout the course. It may recur for short periods throughout the course. If an X-ray is taken, the report may come back pneumonia if the displacement is not shown. It is best to have the picture taken during pain because it is largely the mediastinal pull that gives the pain. There is never a pneumothorax line. The affected side is relatively immobile and sunken in with the ribs close together. The heart impulse can usually be palpated over a wide area. The pulse may be normal or the rate elevated. Cyanosis varies with the degree of collapse. The pain, dyspnea and cyanosis usually subside after one or two days but the sputum, X-ray and physical findings may be present for twelve to fourteen days. The physical findings of the lungs are variable.

Treatment—When unilateral, the condition is never serious although the symptoms seem alarming. The cases will get well without treatment but the giving of CO₂ and steam inhalations, turning the patient on the good side and encouraging the expectoration will speed the recovery. CO₂ inhalations after operation probably prevent its occurrence. If it occurs after thoracoplasty, the chest should be strapped to prevent paradoxical respiration and mediastinal flutter.

Spontaneous pneumothorax—This condition does not often take place post-operatively but it will be discussed here because the findings are opposite to those of collapse. In fact, it is

usually concurrent with activity on the part of the patient. However, it does occur, but as a rule, later in the course when the patient gets more active. Some of these are tuberculous but many are not—Wood has collected a number of cases (non-operatives) which were proved to be non-tuberculous. Ostensibly, it is caused by rupture of the air vesicles or a bronchus, and may or may not engender pus or clear fluid as well as air, in the pleural cavity. In any event, the findings are opposite to those of massive collapse. True, there is sudden chest pain, fever and dyspnea but the mediastinum is displaced to the contra-lateral side and the ribs of the affected side are widely separated in spite of being relatively immobile.

Treatment—When the symptoms demand interference, aspiration of the air or fluid may be necessary and if pus is present, closed drainage is probably the best therapeutic measure.

Pneumonia—Post-operatively, pneumonia requires a certain incubation period. Pneumonia does not show up definitely until the third or fourth post-operative day. Not long ago someone reported aborting pneumonia with the oxygen tent. The symptoms of the pneumonias were given as occurring twelve to twenty-four hours after operation. In the light of what has been said about massive collapse and partial collapse, one wonders if many of these were not cases of partial collapse which would have cured themselves. None of the thirteen cases of massive

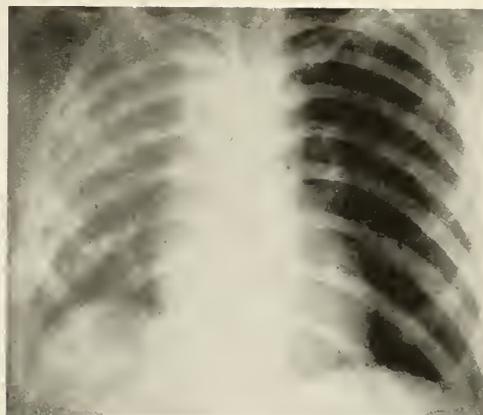


PLATE 2

MASSIVE COLLAPSE (Following Appendectomy)

Note partial return of heart shadow to left side and how lung is clearing after CO₂ gas and postural drainage. Note also how the diaphragm is sucked upward. Complete recovery in ten days.

collapse seen by this author developed a superimposed pneumonia with flatness to percussion. It would seem that massive collapse gives some immunity against pneumonia for certainly the conditions are ideal for its development. On the other hand, partial collapse does not seem to render immunity but is conducive to super imposed pneumonia. This is particularly true in old people and probably plays an equal part with hypostatic congestion in engendering pneumonia. Early cyanosis in pneumonia makes the prognosis very unfavorable.

Prevention includes CO₂, steam and in old people, early mobility and thyroid extract. Steam is very important. The drying out of the mucous membranes is conducive to pneumonia. The hot dry air in our hospitals is not a good thing.

Treatment—Cardiac failure has long been recognized as the usual termination of pneumonia.

Venesection on the appearance of cyanosis with right heart enlargement and intermittent pulse should be practiced. Early cyanosis is always a bad prognostic sign. The use of the oxygen tent is of great value and liberal doses of morphine are helpful. The author has not seen any good results from using digitalis.

Pulmonary Embolism and Thrombosis—This usually occurs when the patient gets active. Since there was a time worn habit of letting operative patients up on the tenth day, this was quite often the day of the accident. Patients having large fibroids removed where the varices in the broad ligament are prominent, arteriosclerotics, old people without evidence of arterial hardening, debilitated people and patients who have suffered shock are susceptible. In other words, any patient with a sluggish circulation is more prone to



PLATE 1

MASSIVE COLLAPSE (Following Appendectomy)

Mrs. S., a young housewife, 16 years of age, had an appendectomy. The next morning she had a sudden sharp pain in the right chest with dyspnea and cyanosis. Heart entirely on right side. (Mediastinal displacement to the affected side.) Note that there is very little heart shadow on the left side. Excellent example of massive collapse. Author's case.

develop an embolus. With the advent of spinal anaesthesia, it is possible another factor has been added when there has been a prolonged blood pressure drop *below the patient's normal*, making possible the formation of soft thrombi in the iliacs. In old people tight strapping in the straight position on the operating table may be a factor. Semi-flexion of the thighs will not compress the iliacs as much in old people as when the patient is flat on the table. Pulmonary thrombosis occurs after major lung surgery such as lobectomy, and occasionally in pneumonia.

Symptoms—Also ushered in with sudden chest pain and dyspnea, sometimes cough and blood spitting. There may or may not be definite findings. Coronary occlusion has a more severe type of pain. The two are often difficult to distinguish. Pulmonary embolism is the more common of the two.

Treatment Prevention—Closer attention and correction of the pre-operative and operative details mentioned in the etiology. In old people thyroid extract pre- and post-operatively may help. The author does not use spinal anaesthesia in old people or bad risks because of the reasons mentioned, although most surgeons advocate it in such cases. Cases have been operated upon successfully whereby the emboli have been removed.

Ayerza's Disease—One case that was seen occurred in a man forty-five years of age. He was a healthy looking man with an unusually ruddy complexion. He complained of dyspnea and cyanosis on exertion. His red blood count



PLATE 3
TUBULAR BRONCHIECTASIS

Case of Dr. A. E. Venables: Mr. B., an elderly man past 60 years of age, has coughed up a half cup of sero-purulent sputum for the past twenty years. Note the straight tubular shape of the bronchi indicative of a low grade tubular bronchiectasis. The bronchi terminate abruptly, are clear cut, and the lipiodol does not enter the alveoli. Roentgenologists unfamiliar with lipiodol in bronchiectasis would probably call this a normal bronchial tree, which it is not. Since the involvement on the other side was the same, only palliative treatment was given with but moderate improvement. Supra-cricoid lipiodol injection by the author.



PLATE 4
TUBULAR BRONCHIECTASIS

Same case, side view. Injection by supra-cricoid method as advocated by Dr. C. A. Hedblom. Note that some of the bronchi have the same diameter at the distal end as at their origin.

was high, there was no palpable spleen and the X-ray showed the arteriosclerotic pulmonary arteries. The blood pressure was not high and the Wasserman was negative.

Treatment is symptomatic.

SEE PLATES 3 AND 4

Bronchiectasis—As a rule, bronchial dilatations follow previous disease such as pneumonia, empyema, tuberculosis, acute bronchitis, chronic bronchitis, etc. In children it sometimes follows measles and whooping cough. There is a fetal form also—usually recognized only at autopsy by the lack of pigment in the bronchi. Sometimes bronchiectasis comes on insiduously and one wonders if this was not a fetal type that has become manifest later in life. Form classification of tubular, nodular, saccular and cylindrical is most widely used. There are two types—the dry bronchiectasis with a non-productive cough and the type with the productive cough. Slight grades of bronchiectasis are usually not diagnosed except in chest clinics, but are called bronchitis. *Any chronic bronchitis that has lasted for more than six weeks will show some degree of bronchiectasis by lipiodol injection.* Unless the roentgenologist is quite familiar with lipiodol, slight grades of the tubular variety will invariably be called normal or called chronic bronchitis. It should be emphasized that a bronchiectatic patient does not have to have clubbed fingers, physical findings or spit up a gallon of sputa. Many cases have but one persistent symptom—cough. Lipiodol injections alone will establish the diagnosis.

The Symptoms—Variations in the findings are the rule. Atelectasis about the dilatations may

give harsh breath sounds. Sibilant and sonorous rales at the bases are frequent. There may be no physical findings and a flat plate may be negative but a lipiodol study will show large saccules.

Recently I saw a case that was being treated for asthma but the bronchiectasis was unsuspected. As a matter of fact, asthmatic attacks, urticaria and acne are frequent in bronchiectasis.

Bronchiectases, hyperthyroids, asthmatics, emphysemas, mitral stenoses all have a low incidence of tuberculosis but a tuberculous patient may develop bronchiectasis, asthma, hyperthyroidism and compensatory emphysema.

Lipiodol by the supra-cricoid method gives the best filling of the bronchial tree. It only takes five minutes to do, upper lobes may be injected and the inconvenience to the patient is minimal.

Pleurisy is a common symptom.

Brain abscess sometimes occurs with bronchiectasis. It is rather a hopeless complication since the abscesses are multiple and small, due to the shower effect of the emboli from the lung sup-puration.

Treatment—This is manifestly a failure the country over.

(1) When it is available pneumothorax is best, but unfortunately the pleural cavity is too often the seat of dense pleural adhesions which prevent its use. Nearly all cases complain of pleurisy off and on. Pleurisy does not mean the patient has tuberculosis.

(2) In children with the disease near the diaphragm and unilateral, phrenicexeresis gives



PLATE 6

LUNG ABSCESS (*Post-tonsillectomy*)

Bronchoscopic lipiodol by Dr. Henry P. Rosenberger indicates lung abscess as shown at the arrow. Referred by the author for lipiodol because of pectoriloquoy in spite of the X-ray report.

excellent results. In older people the dilatations are often too diffuse and too high in the lung to get much of any result with hemiparalysis of the diaphragm. Since this disease is usually bi-lateral, phrenic extraction has but a small field. The author has had no experience with double phrenectomy although it has been done.

(3) In adults nearly all chest clinics advocate thoracoplasty. While this is an excellent operation for tuberculosis, in my opinion it is very unsatisfactory in bronchiectasis and its use therein should be much more restricted than it is at present. Surgeons are inclined to be too enthusiastic. The patient comes in for the cure of cough and sputa. After thoracoplasty he still has cough and sputa or it returns six months to five years after the operation.

(4) Lobectomy is far too formidable and does not assure a cure after its use.

(5) Other measures not being available or being contra-indicated, postural drainage twice a day with occasional lipiodol flushings by the Ochsner method is the best palliative measure. Lipiodol flushings often stop the cough and sputa until the next cold is contracted.

(6) I believe our therapeutics in bronchiectasis need renovating. During the war certain gases caused desquamation of the bronchial tree with subsequent atelectasis. I believe we will be treating bronchiectasis with chlorine or mustard gas in the future by the balloon block method suggested by J. R. Head, utilizing the bronchoscope. At least we will be treating the bi-lateral cases that way.

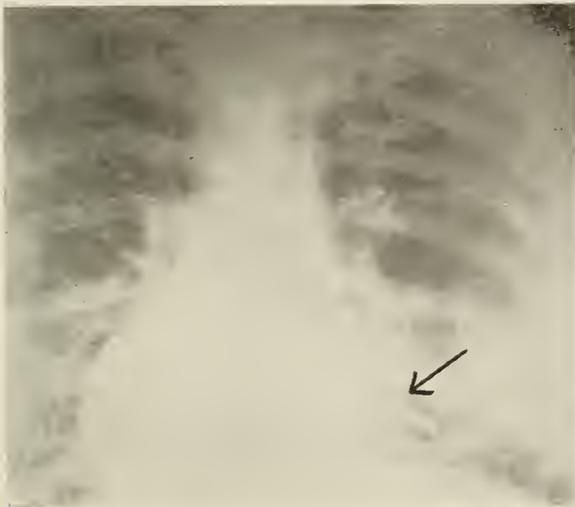


PLATE 5

LUNG ABSCESS (*Post-tonsillectomy*)

Case of Dr. A. R. Hall: J. S., a single girl of 28, complained that she had had a cold for four weeks following tonsillectomy. Marked pectoriloquoy posteriorly where arrow indicates but flat plate gives no evidence. Roentgenologist's report on this plate was "Thickened pleura and pneumonitis."



PLATE 7

LUNG ABSCESS (*Post-tonsillectomy*)

Lateral view, same case. This case would have been ideal for a cure by surgical drainage but the patient refused operation.

Spirochaetal Bronchitis—Vincent's organism occasionally attacks the bronchial tree. Patients are very sick and the course is prolonged. The sputa shows the organism predominating.

Treatment—Neo-arsphenamine in bi-weekly doses of .3 to .6 grams alleviates this condition.

SEE PLATES 5, 6, AND 7

Lung Abscess—Sputum of lung abscess often contains Vincent's organisms, staphylococci, streptococci or combinations of these and pneumococci. Lung abscess often follows tonsillectomies, nasal operations or pneumonia. Occasionally this condition comes on insidiously like a mild chest cold. Observation of the sputum for organisms, elastic tissue and a lipiodol study are valuable. The revelation of blotches of parenchymatous lipiodol or a blocked bronchus is pathognomonic. Parenchymatous lung abscess frequently cures itself by rupturing spontaneously into a bronchus or the pleural cavity or the abscess cavity may remain in the lung after the rupture into the pleural cavity. After the empyema has cleared up one wonders why the patient does not get well until a study reveals the pulmonary excavation.

Pectoriloquy is the best single sign to localize a pulmonary abscess.

A lung abscess in one lung is not evidence that there is no abscess in the other lung. In fact, this happens with more frequency than we realize.

Treatment—This depends on the severity some-

what but as a rule all acute abscesses should be allowed to become chronic. At times, however, surgical drainage is demanded as a life saving measure, especially if the wall is gangrenous.

Usually, however, one should wait at least six weeks with posteral drainage before surgicalizing the patient.

Lung abscesses may stand out easily on the X-ray but at operation they are difficult to isolate—it is somewhat like finding a needle in a foot if you have ever tried that. Here is a trick for localizing such an elusive abscess which few men use but which is very useful. I have seen Dr. C. A. Hedblom use it many times. It simply consists of entering the lung with the syringe under suction pressure. By this method if you glaze the surface of the abscess you will get pus. If you do not aspirate under suction, you may stick the needle right through the abscess and never know it. After the needle has obtained pus, leave it in situ, disconnect the syringe and spread the lung tissue with forceps besides the needle, or follow the needle with the cautery directly into the abscess.

The pleural cavity should be obliterated at the point of entry. Often this has taken place spontaneously by the time of the first operation. Physical signs are more reliable than X-ray to determine point of election of entrance. Pectoriloquy and dullness are the best guides. If the pleura is free, mercurochrome packs should be inserted extrapleurally and the wound closed tight for a week before re-entry. After re-entry, placing packs about the drains in the abscess for the first forty-eight hours may prevent a massive hemorrhage.

Actinomycosis—The sputa of all obscure lung conditions should be thoroughly studied. If there is no sputa, an attempt should be made to produce sputa by the use of expectorant drugs. While pulmonary actinomycosis is usually fatal, there have been cases cured by using large 90 grain daily doses of potassium iodide over long periods of time. Surgery is of no avail until after the lung is rid of the ray-fungus when the residual lung damage may be repaired by proper surgical means.

Multiple fistulae of the chest or kidney complications often presage actinomycosis even in the absence of sulphur granules.

(To Be Concluded in March 15 Issue)



Anal Anatomy, with Particular Reference to the Anorectal Junction*

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THE frequent origin of many of the common diseases of the anal region, at or very near the junction of the columnar epithelium of the rectum and the squamous epithelium of the anal canal, is generally conceded. Pennington says that eight-five per cent of proctologic diseases are located here. To this juncture of tissues is attached several names, the dentate line or margin, the pectinate line, the mucocutaneous line, or junction, the White Line of Hilton, and the anorectal line. I have chosen to use this last term as I feel it is the most descriptive and significant. There is no little confusion as to the name given this line and also as to its exact location relative to other structures. This discussion is an attempt to clear up some of this confusion, but more especially to emphasize the importance of this landmark.

Hilton in his lectures on "Rest and Pain," published in 1879, states, "that in the lower part of the rectum there is a white line which in the living subject any surgeon can recognize, which indicates the junction of the skin and the internal mucous membrane. This white line corresponds exactly with the interval between the external and internal sphincter muscles, is an important landmark, exact and truthful, so that it can be relied upon."

Others authors, principally in the older

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texts, have also described this columnar squamous junction very accurately and some have called it the White Line of Hilton, based on his priority in its description.

One point of disagreement that I have with these authors is that this anorectal junction does not correspond to the depression between the external and internal sphincter muscles. There is no relationship between them. The anal canal may be long or short, depending upon embryologic or pathologic conditions, and if this anorectal line does happen to be in the depression between the muscles, it is purely a matter of chance. The lower end of the rectum and the anal canal are subject to no little variation in location, due to their loose attachments. For instance, in cases with prolapse or protruding internal hemorrhoids, the lower end of the rectum may be outside the grasp of the sphincters and any landmark or lines are, of course, displaced. Observations at hemorrhoidectomies shows the anorectal line well above the external sphincter, except in these cases with redundant pathology. (See Fig. 1.)

A brief review of the embryology of the anorectal junction shows the manner in which it is formed and may suggest reasons for its particular susceptibility to certain types of pathology, as well as its variability in loca-

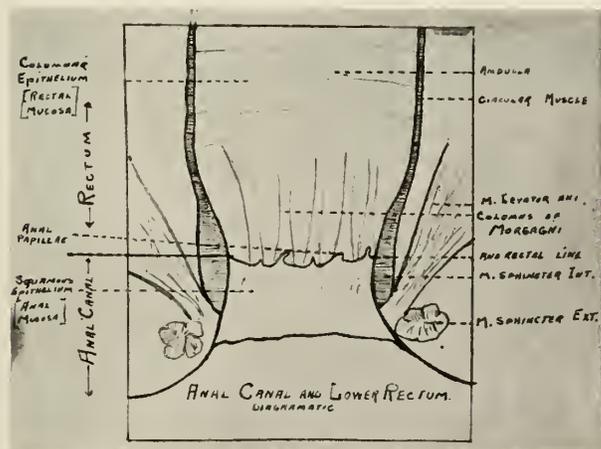


FIGURE 1

Showing the formation of the anorectal line.

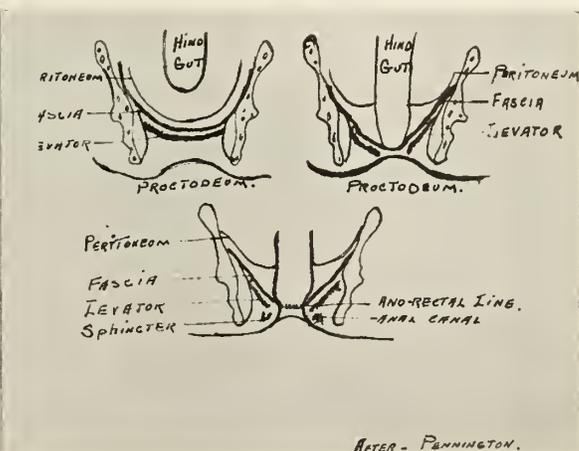


FIGURE 2



FIGURE 3

Longitudinal sections through the anorectal line, showing abrupt change from columnar to squamous epithelium.

tion. The invagination of the ectoderm at the caudal end of the embryo called the proctodeum or anal pit, gradually increases in depth upward, while the blind end of the hind or primitive gut, the posterior division of the cloaca, descends. These blind pouches approximate leaving a septum of entoderm and ectoderm between them. Absorption of this septum completes the connection between the rectum and the anus and leaves a line that indicates the transition from columnar epithelium to cutaneous tissue, the pectinate or dentate line, so called because of its irregular or serrated edge, simulating a comb or saw tooth which I am calling the anorectal junction. (See Fig. 2.) So we have a union of two tubes of different derivation, proctodeal from ectoderm and intestinal from entoderm, and the formation of an anatomical landmark which assumes importance, both as a diagnostic and etiologic one, with the rectum above, and the anal canal below. When this developmental septum is not absorbed, we have the most common type of imperforate anus. We can see that the proctodeum may be long or short, resulting in a variation of the length of the anal canal.

This anorectal junction is not an imaginary one but quite definite, and is seen as an irregular line or ridge, complete in circumference with mucous secreting epithelium above and smooth shiny skin without hair follicles or sweat glands, immediately below. It can be seen in some individuals upon spreading apart the buttocks, with the patient in the inverted or Hanes' position, but it is usually necessary

to insert a short anoscope. If it cannot be easily located it may be identified by fixed and constant anal anatomy.

(1) The anal papillae covered with squamous epithelium are situated on the line between the columns of Morgagni and appear as small triangular buds or excrescences extending upward into the rectum, varying in size, length and number. Although not constantly present, they serve as positive identification of the junction. Some authors feel that these papillae are abnormal, and others that they are the tactile organs of the anus and rectum. Regardless of their function they have a definite topography. Incontinence following a Whitehead operation for hemorrhoids was thought to be due to the removal of the papillae, but is due to muscle division or injury. The real Whitehead deformity, however, is not incontinence but a moisture due to the misplaced rectal mucosa.

(2) The columns of Morgagni, appearing as longitudinal pleats or folds of mucosa end at the line by spreading out in a fan-like formation. Above they gradually disappear in the folds of the bowel mucosa.

(3) The semilunar or anal valves covered with squamous epithelium, are transverse concave, cup-shaped folds suspended between the lower ends of the columns, the free edge of the valves being continuous with the line. Behind these valves are found the anal pockets or crypts of Morgagni which open toward the bowel. Various functions have been attached to these valves, principally that of collecting mucous to aid in the passage thru the canal. That these crypts collect foreign bodies is definite, as small seeds, coarse particles from the stool, spicules of bone, etc., have been removed from them. Hirschman calls attention, in a recent article, to the anal crypts and focal infection, and McKenney cites instances of the removal of a long list of foreign bodies from these crypts. Ball says that these valves are the remains of the embryonic cloacal or anal membrane.

(4) The squamous epithelium immediately distal has a smooth glossy, shiny appearance with a color intermediate between the lower rectal mucosa and true skin and is only moderately vascular.

(5) Experimental touching with a needle point quickly determines the type of tissue, squamous being highly sensitive and columnar, slightly so.

Pennington in his text book brings out the

importance of the anorectal line in three classifications, considering it first as an anatomical landmark; the junction between the body wall and the viscera; as the distal boundary of the intestinal canal; as marking the difference in color between the mucosa and skin; as the junction of squamous and columnar epithelium; as an arterial and venous watershed, proximal to the portal and distal to caval; as a lymphatic watershed; proximal to lumbar nodes, distal to the inguinals; as a nerve boundary proximal from the sympathetic and slight sensation; distal from the cerebrospinal and acute sensation. Second, as an etiological landmark, one variety of imperforate anus marked by the line; the frequency of congenital stricture at this point, the location of the anal crypts and the diseases resulting from their infection; the finding of visceral diseases proximal and epidermic ones, distal. Third, as a diagnostic landmark, certain lesions as pruritus ani, anal fissure and ulcer, external and anal hemorrhoids are found distal, while those involving the mucosa, as proctitis and internal hemorrhoids, are proximal. The line can also very well classify fistulae, those with their internal opening distal being anal, those proximal, rectal.

The histologic changes at the anorectal line are definite.

Johnson says that the transition between the skin and mucous membrane takes place gradually and three separate zones are seen, viz: Columnaris, intermedia and cutanea the transition from the epithelium of the intermediate zone to that of the columnaris, is abrupt and lies at the level of the anal valves. At the lower level of the intermediate zone, it passes into true skin. This is not well marked but it is where the hair follicles make their first appearance.

Schäffer, in Quain's Anatomy, states that the junction of the columnar epithelium of the rectum with the stratified epithelium of the anal canal is less abrupt than a similar change between the esophagus and stomach and that the stratified epithelium is gradually reduced until only the deeper layer remains.

Roeckel, quoted by Buie, says that there was at the "ano cutaneous" line an abrupt change from columnar to squamous epithelium. Buie says the change at the pectinate line is usually found to be gradual, but may be abrupt.

Malmgren states that the change from the mucous membrane of the rectum to the skin of the anus is a gradual one and takes place

in three separate stages. Super-imposed zones are thus formed.

I feel that the transition from squamous to columnar epithelium is abrupt, and that the change from true skin to the mucous membrane of the rectum, (columnar epithelium) is gradual. We must remember when we use the term "mucous membrane" that it may be lined with either squamous or columnar epithelium, and that the anal canal is a mucous membrane of the squamous type, and the rectum of the columnar type. Hence, the name "muco cutaneous junction" is somewhat misleading, so I feel the best terms to use are "anal canal" and "rectum" and the sharp demarcation between them, the "anorectal line" or junction." The terms "pectinate," "dentate" or "White Line of Hilton," if by this is meant the columnar squamous junction, may also be used. I have examined sections from a number of individuals and these show a sudden lining change from columnar to squamous epithelium at the anorectal line. (See Fig. 3-4-5.) It is almost uniformly observed, however, that a few rectal glands are seen under the squamous epithelium, but only for a very short distance. The epithelium immediately distal to the line is not true skin and shows slight cornification, the layers being rather indefinite; no dermal papillae are seen and the Malphigian layer varies in thickness from true skin—some thinner, some thicker and may be called a transitional squamous epithelium, so the change into true skin is gradual. The histologic changes at the anorectal junction, however, are definite.

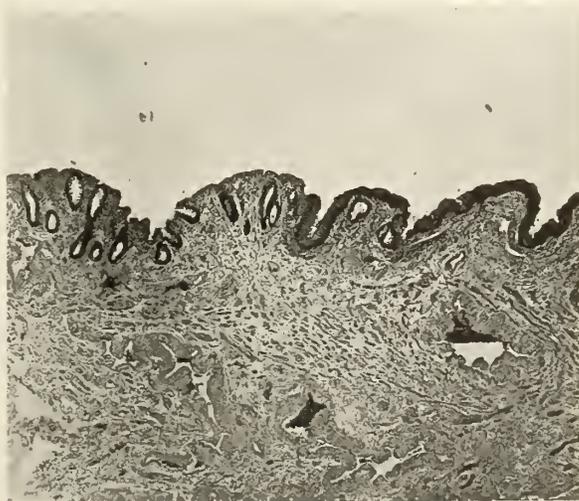


FIGURE 4

Longitudinal sections through the anorectal line, showing abrupt change from columnar to squamous epithelium.



FIGURE 5

Longitudinal sections through the anorectal line, showing abrupt change from columnar to squamous epithelium.

Why so many of the common diseases of the region occur at this junction of tissues may be due to an anatomically, or structurally weak connection, but much more probably, because of the presence of the anal crypts. These crypts, formed at the same time that the anal canal became patulous, become deeper as age advances and recurrent infections in them occur. To them may be definitely traced many cases of anal fissure, ulcer, and fistula. The crypt became infected and the process broke through the base and gradually burrowed underneath the mucosa of anal canal, leaving a sinus which was so superficial that the covering did not hold and a trench or fissure was formed. If the ulceration is more circular than longitudinal, it is called an ulcer, but both due to the same underlying causes. Fistulae with internal openings have the same etiology as fissures, except that the infectious process was deeper and a more devious tract was formed to the surface by the path of least resistance.

Empirically some cases of pruritus ani are due to infection in the anal crypts which become deeper, and often extend outside the anal canal subcutaneously, others to hypertrophied or inflamed papillae. Cases of colitis and proctitis have also been benefited by cryptotomy, indicating an infectious cryptitis as a predisposing factor.

The line serves as a means of classifying and identifying hemorrhoids—those proximal with their covering of columnar epithelium are internal hemorrhoids, and those distal with squamous epithelium, anal or external ones.

Carcinoma is rarely found on the line, but either proximal or distal. The squamous cell type of growths being distal, so the junction serves only in classification.

Hence, in the intelligent treatment of diseases of the terminal rectum and anus, the recognition of certain anatomical landmarks is necessary, and may be made on inspection, and the position of certain fixed structures, or the presence of certain typical lesions. Without locating at least the anorectal junction, is to treat the lesions blindly and with unsatisfactory results.

There is one confusion in terminology that I wish to mention. Some authors have attached the name the "White Line of Hilton" to an entirely different finding in the canal, having interpreted Hilton's description as meaning this, rather than the actual squamocolumnar junction, namely to that narrow pale ring which is sometimes seen in the anal canal when the nates are retracted. This finding is inconstant, poorly defined and bound on both sides by squamous epithelium, and its significance questionable, some stating that this finding represents the depression between the sphincters. It is hard to believe that Hilton meant this line, and said junction between skin and internal mucous membrane.

Hiller of Milwaukee, who has done some excellent work on the anatomy of the anal sphincters, stated in a personal communication relative to this finding, that it was his conception that Hilton's Line was distal to the mucocutaneous or anorectal line which, of course, this pale white line is. He felt that it was found at a point where the cornified squamous epithelium was replaced by the uncornified variety, and also that the internal sphincters definitely extended beyond it. He also feels that this pale line represents the termination of the muscularis mucosa underneath, and in longitudinal sections, it appears as a depression, which when the nates are retracted, or an instrument introduced, is ironed out, appearing as a pale area. What this finding represents, I am not sure, but I do not feel that it corresponds with the depression between the muscles to any constant degree. This pale line is not, to my interpretation, the white line that Hilton described and not to be confused with the anorectal junction. I have longitudinal sections through two rectums, and these show a definite depression or sulcus distal to the anorectal

line and also that the internal sphincter muscle extends below this sulcus.

CONCLUSION

(1) Hilton's Line as described by him, may be either the anorectal junction, or the pale ring in the anal canal, depending on interpretation.

(2) Neither of these lines represent the depression between the external and internal sphincter muscles to any constant degree.

(3) There is no constant relation between the anorectal junction and the underlying muscles.

(4) This anorectal junction is an embryologic remnant and is important in etiology, treatment, and classification.

(5) The pale line sometimes seen in the anal canal likely marks the termination of the muscularis mucosa underneath, and the change from transitional to true skin, and is not to be confused with the anorectal junction.

(6) The transition from columnar to squamous epithelium at the anorectal line is abrupt. The first squamous epithelium encountered does not contain hair follicles or sweat glands, and so differs histologically from true skin.

(7) The columnar squamous junction should be called the anorectal line. It is important to recognize tissue and derivation differences. The dentate or pectinate lines are acceptable terms based on structural appearances.

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THE PROGRAM OF THE MINNESOTA STATE SANATORIUM

(Continued from Page 77)

to tuberculosis. So far as possible we try to define the two phases of our work, at the same time respecting the family doctor's rights, the county officials' wishes and the patient's well-being.

*"Tuberculosis Survey in an Indian County in Minnesota," by Otto F. Ringle, M.D., Floyd F. Feldman, M.D., and H. A. Burns, M.D., *THE JOURNAL-LANCET*, September 15, 1932; "Tuberculosis in the Indian," by Herbert A. Burns, M.D., *American Review of Tuberculosis*, Vol. XXVI, No. 5, November, 1932; "Result of Collapse Therapy in an Indian Sanatorium," by W. A. Abbott, M.D., Onigum Sanatorium, and H. A. Burns, M.D., Minnesota State Sanatorium, *THE JOURNAL-LANCET*, October 15, 1932.



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RETURNING THE PHYSICIAN TO THE PICTURE

Physicians to the private practice of medicine will hail with delight the announcement in this issue of the program of the Minnesota State Sanatorium. For nearly two decades the private general practitioner conscientiously and honestly diagnosed tuberculosis but the cases were hurried away from him, rarely to be returned. Law organizations and others convinced the public, and even the physician, that he was not capable of treating tuberculous patients. He had graduated from a good school of medicine and had splendid fundamental training, yet some mysterious shroud was thrown about tuberculosis in such a way as to leave the general practitioner on the outside. What a blow to tuberculosis control work to omit from the forces the most important group of workers—the general practitioners—leaving them with little or no opportunity to observe tuberculous patients and depriving them of that stimulation and desire to become and remain well-informed concerning this major disease.

The following statement of Dr. Burns is most significant: "It is the plan of the Minnesota State Sanatorium to co-operate to the fullest extent with the family doctor, realizing that he is the only successful case-finder and that the responsibility and after-care and guidance must continue to rest with him." According to the plan outlined,

every physician's office becomes a tuberculosis clinic and with this should come the abolition of the so-called free tuberculosis clinic, except for those few operated in our teaching and charitable institutions, where cognizance is given to eligibility; in other words, those operated for the poor. In sparsely populated parts of our state, where physicians' offices are far apart, an occasional tuberculosis clinic of the oldtime type might be justified. After this plan goes into effect, the interest of practitioners of medicine in the diagnosis and treatment of tuberculosis will be restored. They will not be afraid to send their patients to the sanatorium when they deem such care is necessary from the standpoint of protecting other members of the family, as the plan specifically provides that the patient be returned to his practitioner of medicine at the earliest possible moment, consistent with the safety of the family. In fact, the physician's interest is maintained in the patient through frequent reports from the institution. One of the excellent features of the entire plan is that patients are returned to their physicians with the understanding that such physicians be compensated by the county commissioners at a much smaller expense to the taxpayer than would be possible if the patient were to remain in the sanatorium. No outpatient department is to be maintained. With the new methods of finding minimal cases of tuber-

culosis and the use of such simple forms of collapse therapy, as artificial pneumothorax and phrenic exeresis, the average period of hospitalization of the tuberculous patient can be very materially reduced. Dr. Burns is to be congratulated upon developing a plan which "respects the family doctor's rights, the county officials' wishes, and the patient's well-being."

J. A. M.

CANCER OF THE RECTUM

It has been jokingly but effectually stated that "if you don't put your finger in the rectum, you may get your foot in it."

No physical examination is thorough or complete that does not include a respectful consideration of that structure.

It is an important fact that all rectal cancers and cancers of the lower recto-sigmoidal group can be diagnosed by the palpating finger. Blood in the stools, pain and tenesmus should cause suspicion of cancer, and a single, punched-out ulcer with indurated and overhanging edges is confirmatory. It is unfortunate that this simple procedure should so often be neglected until the cachexia of systemic involvement and impending dissolution writes its "*mene tekel*" upon the wall of a drowsy conscience.

It is interesting to note the improved results reported after decompression of the bowels for a few days before the operation, and rehabilitation by transfusion. The consensus of opinion seems to be that colostomy and subsequent resection is preferable, on the whole to saving of the sphincter.

Early diagnosis and improved technique go hand in hand in this campaign against malignancy.

A. E. H.

UNCLEAN HOSPITALS

No one would think of practicing surgery in the absence of surgical asepsis. The surgeon brings his patient with pyogenic micro-organisms to the hospital. During the operation extreme care is taken to destroy all of those organisms set free in order that they may not contaminate the wounds of patients later brought to the operating room. If such patients have pus discharges, through sinuses, et cetera, after they are returned to their rooms, every precaution is taken to destroy all of the micro-organisms eliminated. In other words, it is just a question of keeping clean the operating rooms, as well as the patients' rooms. While this great care is being taken in one part of a hospital, in another part patients with respiratory diseases may cough

freely and cast off discharges from the nose, throat, and lungs, with very little attempt on the part of the institution to prevent the spread of the pathogenic micro-organisms to visitors, employees, or attendants. The hospital is a place where people being attacked by pathogenic micro-organisms are congregated. Therefore, it may easily become a hotbed for the transmission of disease. Sometimes one hears the statement that on the obstetrical services of certain hospitals there is a far higher incidence of puerperal sepsis than one finds in the homes in a country practice. The explanation ventured is that the hospital is infested with micro-organisms capable of causing this condition, whereas, in the home they may be less prevalent or entirely absent. This is a serious reflection upon the cleanliness of any institution.

We have learned how to prevent the spread of most communicable diseases and from our knowledge has been developed a communicable disease technic, called medical asepsis. In the Charles V. Chapin Hospital of Providence, Rhode Island, this has been in practice with great success for many years. The Ancker Hospital in St. Paul is finding medical asepsis of great value in the prevention of disease; in fact, its superintendent states that it is being employed among all kinds of acute infectious diseases, such as the exanthemata, pneumonia, influenza, acute tonsillitis, acute bronchitis, et cetera. He finds the cross-infection rate has been less than one-half of one per cent since medical asepsis has been practiced. It is in practice in certain private hospitals of this state, such as Fairview in Minneapolis and St. Mary's in Duluth, with very little expense and inconvenience on the part of the hospital, and with great advantage to the patients, visitors, and the employees. The technic is simple and can be instituted anywhere. This fact should remove the objection some hospitals have to the communicable disease patient.

The hospital should operate in such a way, from the standpoint of transmission of disease, to merit the confidence of the public. When a patient enters an institution, he should be absolutely assured that he will be so treated that his disease will not be passed on to others, and that while in the hospital he will not be allowed to contract any other communicable disease. Medical asepsis administered with the proper technic assures such protection to him, his visitors, and the employees and attendants of the hospital. It is not an uncommon experience to see visitors with acute coryza, bronchitis, or even more serious communicable diseases, enter the rooms of

hospital patients with no protection whatsoever afforded the patients. They are helpless. The medical superintendent of a large hospital in this state told me that in a single week three of his patients, who were convalescing satisfactorily from other conditions, died of pneumonia, which he firmly believed was carried to them by visitors suffering from respiratory diseases. This and many similar experiences led him to institute medical asepsis.

During the recent influenza epidemic, approximately the following statement appeared in a daily paper: "Because of the prevalence of acute respiratory diseases and their harmful effect upon hospital patients, no visitors will be admitted to the—hospital until further notice is given. Visitors will be admitted in the case of extreme necessity

only, officials said." The absurdity of such action is obvious. In other words, under ordinary times neither the patients, visitors, employees, or hospital attendants of that institution are offered adequate protection. In most all communities there are ever present sporadic cases of coryza, bronchitis, and even other communicable diseases. Every hospital should protect its patients against such cases among visitors by the institution of medical asepsis. The number of students of nursing and medicine who develop communicable diseases from the patients they attend each year is appalling. Nearly all of this could be prevented by the institution of medical asepsis, which simply means keeping the hospital clean.

J. A. M.

Proceedings Minnesota Academy of Medicine

Meeting of December 14, 1932.

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 14, 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 43 members present.

Minutes of the November meeting were read and approved.

The following memorial to the late Dr. R. E. Farr was read by Dr. E. L. Gardner, and a motion was carried that it be adopted and spread on the minutes of the society and a copy sent to the nearest relative:

ROBERT EMMETT FARR: Born February 15, 1875. Died June 30, 1932.

Robert Emmett Farr was born at Montello, Wisconsin, on February 15, 1875. His parents were Irish born, and devout Roman Catholics. After graduation from the high school in Milwaukee, Dr. Farr entered Rush Medical School of Chicago from which he was graduated in 1900. His contact as a student with the brilliant Rush Medical School group of surgeons, and with Dr. James Dunn while serving as an intern at the old St. Mary's Hospital in Minneapolis, stimulated his keen interest in surgery and especially in the possibilities of local anesthesia. He served as assistant and partner to Dr. Dunn for several years until the latter's untimely death. Dr. Farr was on the Surgical Staff of the Medical School of the University of Minnesota from 1902 to 1914, where he soon gained a reputation as a brilliant

student and almost indefatigable worker. Very early in his career he recognized the possibilities of local anesthesia and was a pioneer in this field. All his spare time was devoted to anatomical research or to work in the department of experimental surgery. Much of the enormous expense for equipment, moving pictures of technic, and many other expenditures were borne by his own private income. His work became so well known that doctors, not only from all over America, but also from England, France, Germany and Australia came to his clinic to learn his technic and watch his operations. His contributions to medical literature, especially in the field of local anesthesia, were so well received that he was frequently invited to give clinics and orations all over the United States and Canada. Although at first his work was not always well received, the opposition only stimulated him to greater effort to prove his viewpoint.

In 1923 he published his monograph, "Practical Local Anesthesia," although he had repeatedly delayed its publication until his evidence was sufficiently convincing to reach the critical reader. The book has passed through its second edition and is recognized throughout the world as one of the best textbooks on practical local anesthesia. For his pioneer work on local anesthesia, Dr. Farr's name was prominently mentioned throughout the United States as a candidate for the Nobel Prize, but finally failed to receive this recognition.

His contributions were also to the field of general surgery including works on cleft palate, abdominal surgery, fractures and other topics. His

literature was terse and readable; and his articles were always well illustrated with original drawings. His interest in medical literature was expressed by his keen interest and active part in the development of Minnesota Medicine, serving upon its Editing and Publishing Committee as long as his health permitted.

Dr. Farr's inspiration to young men is best shown by the number of well-trained surgeons, with the best ideals of medicine, who received their training under him. It is known but to few that he aided many poor boys through medical school or advanced funds for young graduates with which to start practice. To the honorable physician who was down and out, his generosity with his encouragement, medical care, or with financial help seemed unlimited. Wherever he might be, in hospital, club or home, he was always surrounded by a circle of true friends. His human understanding and sense of humor always seemed to surmount the most embarrassing situation.

Dr. Farr always found time to attend medical societies, to participate in the programs, and to accept office when forced upon him. He was a past president of the Hennepin County Medical Society, and a member of the Minnesota State 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. He was elected a member of this Academy in 1916, was an habitual attendant and frequently took part in its programs.

Dr. Farr was married to Miss Mary Scallen, of Minneapolis. One son, Paul, was born, who died suddenly while studying medicine at the University of Minnesota.

Dr. Farr himself, in his college days, was a great athlete, having been captain of the Rush Medical football team and at one time football coach at Macalester College. Although a strong, robust young man, he later in life suffered a chronic ailment of the spine which caused him great pain so that for many years he had to wear an orthopedic support in order to do his work. While suffering this handicap, sufficient to have discouraged most men, he did the greater part of his research and writing. During the last four years of his life he was confined at home by intense suffering, but that indomitable spirit and optimism kept him at work revising his book, contributing to a system of surgery, and keeping abreast with the latest in medical literature. The death, first of his son, and then of his wife, seemed to be more than he could bear, but each time he

mastered himself through the medium of his work. Medicine was his life, his play and his religion. He was a distinct personality, always ambitious and energetic, yet lovable and generous. He loved argument, fought for it when he thought he was right and admired others for doing the same; yet he was willing to admit when he was wrong. In spite of his many faults, which he himself knew and attempted to surmount, he nevertheless represented much of what is best in medicine.

The community, the medical profession and this Minnesota Academy of Medicine has lost a real friend and colleague in the untimely death of Robert Emmett Farr.

JOHN E. HYNES,
C. N. SPRATT,
E. L. GARDNER, *Chairman*,
The Committee.

Upon ballot, the following officers were elected for the year 1933:

President Dr. C. D. Freeman (St. Paul)
Vice-president . . Dr. A. E. Wilcox (Minneapolis)
Secy.-Treas. . . Dr. R. T. LaVake (Minneapolis)
(re-elected).

The scientific program was as follows:

DR. F. H. K. SCHAAF (Minneapolis) read his Inaugural Thesis entitled "Recurrent Gout."

DR. ARNOLD SCHWYZER (St. Paul) read a paper on "Thrombophlebitis Sepsis."

DR. MARTIN NORDLAND (Minneapolis) reported the following case of Mesenteric Cyst in a boy nine years of age, with operation and recovery.

This patient is a boy nine years of age who was first seen June 14, 1932. His health had been unusually good until early in the morning of that day when he began to complain of nausea and loss of appetite. In the afternoon he developed rather severe colicky pains in his lower abdomen which seemed to localize more in the right portion than the left. They continued intermittently and the next day they were sharper and more frequent as well as accompanied with spells of vomiting. The evening of the second day the pain seemed to be located mostly in the right upper portion of the abdomen and for the first time a mass, lying to the right and just above the level of the umbilicus, was noticed by both the boy and his mother.

June 15th the boy appeared fairly well; his temperature and pulse were normal and on physical examination nothing of note was found except a rounded movable mass in the right upper portion of the abdomen just under the costal margin. This measured 12 to 14 centimeters in diameter, it was

not tender and it was not attached to either the posterior or anterior abdominal wall, although it lay quite close to the latter. Examination of the urine was reported as normal and the white cells numbered 9,600 per cubic mm. of blood.

Exploration of the abdomen through a right rectus incision was done June 17, 1932. A large rounded cyst measuring 12 cm. in diameter was present lying in the mesocolon between the greater curvature of the stomach and the transverse colon. In the process of removal of the cyst its wall was ruptured, allowing a dark red fluid to escape but the margins of the cystic area were removed completely without interference to any of the large vessels of the mesentery or with the stomach or colon. The defect in the mesentery was repaired without difficulty. Convalescence was uneventful and the boy left the hospital the twelfth day postoperatively. He has been well ever since (November 20, 1932).

Sections for microscopic study taken through the mass of tissue removed showed a massive infiltration with blood. No definite lining to the cyst could be made out.

In a recent review of 22 cases of primary mesenteric tumors, Rankin and Major found only two which were cystic sanguineous in character, such as that reported in this communication. Likewise from a review of the literature it seems that this type of lesion is quite rare. Moynihan has postulated that the usual etiologic factor in cysts of this kind is trauma and he further states that hemorrhages of this character and in this location may result in several alternatives: The hemorrhage may develop into a cyst; the hemorrhage may occur in a pre-existing cyst, or into a solid tumor of the mesentery; the greater part of the solid constituents of the effused blood may disappear and a simple serous cyst result; or, finally, the fluid component of the blood may be absorbed and a more or less solid tumor persist. The solid tumors of this location are composed of the lipomata, fibromata and malignant neoplasms especially sarcomata. The diagnosis of these tumors is not easy because of the multiplicity of symptoms which they may produce. However, in the presence of any mobile abdominal mass extrinsic to the gastrointestinal tract, mesenteric neoplasm should be borne in mind. According to Rankin and Major, the prognosis of benign tumors is favorable but in malignancies it is poor.

In the case presented, no doubt a trauma of some sort was the cause of hemorrhage into the mesocolon resulting in the formation of a hematoma and this was removed before any complications could take place. The case is of interest

from two standpoints. In the first place the differential diagnosis was difficult until the hematoma manifested itself by the presence of a mass. When this took place, surgical intervention was imperative. Secondly, the extirpation of the cyst was attended with considerable technical difficulty due to the proximity of the mass to the large vessels of the colon and stomach so that freeing and removal of the tumor was rather hazardous.

REFERENCES

- Moynihan, B. G. A.: Mesenteric Cysts. *Ann. of Surg.*, 1897, XXVI, 1-30.
Rankin, F. W., and Major, S. G.: Tumors of the Mesentery. *Surg., Gyn. & Obst.*, 1932, LIV, 809-817.

DISCUSSION

DR. O. H. WANGENSTEEN (U. of M.): Primary tumors of the peritoneum are playthings of the surgical pathologist. The chief interest of surgeons in them is whether or not they can be removed and knowledge of the fact that they are not readily identified preoperatively.

In the recognition of abdominal tumors, the teachings of Richard Bright still hold true. In writing on abdominal tumors he said, "The sources to which we turn for evidence respecting the existence and nature of abdominal tumors are the form and appearance suggested to the eye; the form still further discovered by the touch; the resistance ascertained by pressure; the sounds elicited by percussion; and in a few instances, the sounds perceptible to the ear, either alone or by the aid of the stethoscope; and besides these local and physical signs we look to the general condition of the system, and of the various excretions as rendering us most assistance and being frequently indispensable toward the formation of a tolerably correct diagnosis."

Though our knowledge of abdominal tumors has been considerably augmented by frequent exploration of the abdomen, our criteria of physical examination are identically the same as those employed by Bright. The only valuable addition to our diagnostic armamentarium, as far as abdominal tumors are concerned, have been the X-rays. The manner of displacement of the stomach or the colon by the tumor mass as visualized after injection of barium gives valuable information of the location of the tumor.

There are three questions which one usually puts to himself in making any diagnosis, viz., (1) What is the functional disturbance? (2) What is the anatomy of the lesion? (3) What is its probable pathological nature?

In many acute as well as chronic ailments of the abdomen, the nature of the functional disturbance alone suffices to suggest the character of the pathological lesion. In the instance of a mesenteric cyst, however, there is often no functional disturbance and the pathological nature of the lesion has to be determined solely upon its anatomical relations, and remains unfortunately often a matter of conjecture until the abdomen is opened.

The value of inspection in the diagnosis of abdominal swellings was forcibly impressed upon me by the following case. A middle-aged woman with hypertension

was admitted to the hospital from the medical clinic for paracentesis of the abdomen, the diagnosis being ascites. As the patient lay on the hospital litter with the abdomen bared, the attending surgeon, Dr. W. E. Sistrunk, who saw the patient for the first time across the room, remarked, "That is not ascites." An incision instead of paracentesis was made and two large ovarian cysts were removed. The abdomen of ascites is broad. The abdomen of a large intra-abdominal tumor is protuberant. The altered contour of the abdomen with change in posture should always be sought when free ascitic fluid is suspected as well as areas of shifting dullness as demonstrated by percussion.

The location of the protuberance is of great diagnostic importance in abdominal tumors. I recall hearing Dr. A. T. Mann, in discussing a paper on pancreatic cyst somewhat more than ten years ago, remark that Dr. J. Collins Warren, of the Massachusetts General Hospital, had walked into the operating theater when a patient with swelling in the left upper abdomen was being operated upon. The abdominal incision was being made. Dr. Warren said, "I see you have a pancreatic cyst." The surgeon stated that he had studied the case thoroughly and had failed to come to a conclusive opinion. The operative findings confirmed Dr. Warren's impression. Such a case came under my attention last summer. Mere inspection suggested the diagnosis though the patient had some months before been given several X-ray treatments under the diagnosis of a retroperitoneal sarcoma. On palpation, alternating fluctuant and solid areas were felt. The tympany of the stomach was percussed out over it. A diagnosis of cystadenoma of the pancreas was made. Fifteen hundred cubic centimeters of a brownish fluid in which amylase was later demonstrated was aspirated at operation. Extirpation rather than marsupialization was done because of the known tendency for malignant transformation to occur in cystadenomas of the pancreas.

Before the patient was dismissed from the hospital, another was admitted with the diagnosis of a pancreatic cyst. Though the tumor mass was said to be large on palpation, no visible protuberance was observed on inspection. The very absence of a visible protuberance when the mass itself is large, in my experience, rather militates against the presence of a cyst originating from the body or the tail of the pancreas. On palpation of the mass it was easily felt posteriorly in the loin by ballotment as well as anteriorly, suggesting the presence of a renal tumor, which impression subsequent pyelographic studies and operation verified.

In the presence of a movable tumor, the sector described by its displacement, as pointed out by Pagenstecher, is of importance in determining its source of origin. An ovarian cyst can be displaced upward in only a limited fashion, but may be pulled into the bottom of the pelvis. A movable hydrops of the gall-

bladder has a slight range of motion downward, but may be pushed freely upward.

A large intraperitoneal tumor mass displaces the stomach and colon posteriorly, whereas a retroperitoneal tumor such as a large pancreatic cyst displaces the stomach and the colon against the anterior abdominal wall. Such displacements may be beautifully shown in a lateral film of the abdomen after the ingestion of an opaque meal. These displacements, as observed by the aid of the roentgen rays, though of extreme value, are not infallible in determining the intra- or retroperitoneal origin of a tumor mass. In doubtful instances the absence or presence of displacement of the ureter as observed after passing an opaque catheter will accurately determine whether the mass arises within or behind the confines of the peritoneum. An intra-peritoneal tumor will not alter the direction of the ureter, whereas a large retroperitoneal tumor will distort its course.

Mesenteric cysts may partake of the physical findings of an intra- or retroperitoneal swelling depending upon whether it grows forward between the leaves of the mesentery or expands in the retroperitoneal space. I should like to relate briefly the details of a case of mesenteric cyst that came under my observation a few months ago. A man aged 65 came because of gradual enlargement of the abdomen. He had no other subjective complaints. A rounded protuberance (less abrupt than in pancreatic cyst) was present, the greatest prominence being to the right of and below the umbilicus. The tumor mass was fluctuant and dull on percussion. It could be displaced freely from side to side, but only in a limited degree in the long axis of the mesentery. The displacement as visualized by the X-rays pointed to a retroperitoneal tumor. A diagnosis of mesenteric cyst was made. At operation 1300 cc. of a bloody fluid was aspirated, in which amylase later failed of demonstration. The cyst wall was adherent to the aorta and the vena cava. It was freed from the aorta with relative ease, but a small lateral tie had to be placed where it was finally cut away from the vena cava by sharp dissection. The bloody content of the cyst may have been due to extravasation from the vena cava, which virtually ran through it. Convalescence was complicated by the occurrence of a small evisceration which healed without untoward event.

Mesenteric cysts are usually classified on the basis of their content. The serous cyst described by Mr. Nordland occurs most frequently. Chyle and blood mesenteric cysts are less commonly observed. A chylangiomas cyst of grape-fruit size in the mesentery of the sigmoid flexure was also recently excised at the University Hospital.

The meeting adjourned.

R. T. LAVAKE, M.D.,

Secretary.

Proceedings of the Minneapolis Clinical Club

THE regular monthly meeting of the Minneapolis Clinical Club was held in the lounge of the Hennepin County Medical Society on December 8, 1932. The meeting was called to order by the president, Dr. Archie H. Beard.

Minutes of the November meeting were read and approved.

The scientific program of the evening was as follows:

Dr. Lawrence Boies presented his Inaugural Thesis entitled, "The Interpretation of Some Common Symptoms Related to the Ear, Nose or Throat," followed by a general discussion.

Dr. Malcolm B. Hanson presented his Inaugural Thesis entitled "Congenital Anomalies of the Vertebra," with slides, followed by a general discussion.

THE INTERPRETATION OF SOME COMMON SYMPTOMS RELATED TO THE EAR, NOSE OR THROAT

LAWRENCE R. BOIES, M. D.

The objective study of human discomforts is concerned with a symptomatology in which the ear, nose and throat have a large share; I venture to say, a larger share than is allotted to any other area which has been made the object of special study. One reason seems obvious. It is an area intimately related to at least 8 of the 12 cranial nerves and a majority of the special senses.

I wish to refer briefly this evening to three symptoms rather common place in their incidence. In reviewing the medical histories of patients referred for special examination in dispensary practice, one is certain to find with great frequency complaints which have been recorded as 1, Dizziness; 2, Headache, and 3, Dysphagia. In certain age groups, of course, these symptoms preponderate.

DIZZINESS

In the lay mind at least, the term dizziness is applied to a variety of subjective disturbances, such as the feeling of faintness, the blurring of vision, spots before the eyes, light-headedness, etc. The word comes to us from the Middle English "dusi," meaning foolish. Its application in medical terminology is interchanged with the term vertigo, which comes from the Latin "vertere," meaning to turn. The use of this word connotes a definite group of phenomena relative to disturbances of the vestibular mechanism.

In its simplest analysis, the equilibratory apparatus consists of the semicircular canals and their connections. These canals contain fluid the movement of which produces stimuli in certain specialized hair cells. These stimuli are transmitted to central connections which in turn control muscular equilibrium. This function of

equilibrium is dependent in a large measure on the continuous flow of tonus impulses from the vestibular end organs to the skeletal muscles. When the tonus impulses from the two ears are equal, a state of equilibrium is preserved. Anything that increases or decreases tonus impulses from one side, produces a disturbance of equilibrium and vertigo. The constant flow of these impulses seems to be dependent on the to and fro movement of endolymph brought about by cardiac pulsations.

The manifestations of disturbances of vestibular function are well known, especially the occurrence of a sense of definite rotation in relation to objects and space, or the rotation of objects and space, the occurrence of falling in a specific direction, the presence of nystagmus, and the usual accompaniments of nausea, pallor, and perspiration and at times vomiting. In the production of these disturbances, the cause may be listed in one of five groups:

1. *A lesions in the ear itself.*—This results from an acute or chronic process related to the middle ear and cochlea. The relationship is determined by the objective evidence of middle ear disease and deafness and tinnitus as evidence of cochlear involvement. Attention has usually been called to the ear; in fact the patient realizes himself that he has an ear disturbance.

2. *A Lesion Involving the Vestibular Intracranial Pathways.*—Hemorrhage is probably the most common factor in this group; either the hemorrhage of apoplexy or trauma. The workman who complains of dizziness following cerebral concussion has often been dismissed with a diagnosis of compensation neurosis. In the last few years, several studies of this type of case have appeared in the literature citing the objective neuro-otologic findings in the presence of certain subjective complaints. These findings gave evidence of damage to the vestibular mechanism. Other causes of lesions of the vestibular intracranial pathways suggest themselves in cases of tumor, abscess, gumma, multiple sclerosis, et cetera.

3. *Vasomotor Disturbances.*—These are probably the most common of all. It is known that in vasoconstriction the tonus impulses of the affected side will be diminished, and increased in vasodilation. The effects are usually transitory.

4. *Toxemias.*—The ear mechanism may be involved in toxemias from any organ or any part of the body. These effects have long been appreciated. Drugs such as alcohol, lead, and quinine, the diseases of nephritis, syphilis, and the infectious fevers, particularly mumps and scarlet fever, and pregnancy, may be etiological agents. The manifestations are often fleeting, but permanent impairment may occur.

5. *Ocular Disturbances.*—Vestibular dysfunction from eye disturbances is usually transient in character and of a mild degree. It is corrected by relief of a refractive error.

It is not within the scope of this paper to review the technique of examining the vestibular mechanism. The tests are well known through their establishment on a practical basis by the work of Barany. By increasing through stimulation the tonus impulses from one semi-circular canal or another, we observe the phenomena of imbalance produced by an imbalance of the tonus of the two sides. When the alteration is in the peripheral mechanism, the stimulation can produce only the reactions of a normal labyrinth except for the factor of intensity. When the alteration is along the central pathways of a vestibular nerve and the peripheral mechanism is intact, instead of arousing normal impulses we arouse impulses that are perverse—a horizontal nystagmus when it should be rotary or vice versa, past pointing that is perverse, et cetera.

When the fundamentals of these tests were first recognized, it seemed that a means might be at hand to localize intracranial lesions. This has been possible only to a limited extent.

The vestibular tests as used today enable us to:

1. Distinguish between the cause of vertigo as due to a lesion in the peripheral mechanism or one affecting its central connections.
2. To diagnose a lesion of the cerebello-pontile angle.
3. By history and inference to assure ourselves of the probability of irritation of the vestibular apparatus by vasomotor disturbances and toxemias, the affects of which are transient. In permanent impairment the evidence is present in positive objective findings.
4. To secure additional evidence pointing toward a lesion as being above or below the tentorium.

HEADACHE

The individual afflicted with headache not accounted for by ocular disturbances or some disorder elsewhere in the body sooner or later lands in the hands of a rhinologist, often with the self-made diagnosis of sinus disease. There is a tendency to attribute to the sinuses headaches not readily accounted for otherwise.

In the presence of evidence of acute infectious conditions in the nose and paranasal cavities, the history, and a significant nasal discharge, suggest at once a logical explanation of the relationship of a head pain. In the absence of these findings, headache caused by nasal pathology is classified as follows:

1. *Headache resulting from pathology in the sphenoid sinus or posterior ethmoid cells and affecting the Vidian nerve or Meckels ganglion.*

The morphological variations of the sphenoid and ethmoid sinuses are well known. There is no rule by which the pneumatizing process limits itself. We therefore often observe sphenoid sinus which has extended into the great wing of the sphenoid bone, or into the pterygoid plate, and it is not uncommon to find the Vidian and Maxillary nerve mounding up in bold relief in the sinus wall or floor. The posterior ethmoid cells may also extend laterally in various directions and come in close relationship to the Optic and Maxillary nerves and Meckels ganglion.

Infections in the sphenoid sinus and in these ethmoid cells, either through the direct relationship of an acute

process, or the hyperplastic changes resultant to repeated irritation, when headache is caused, produces a distribution of pain that is typical of involvement of the Vidian nerve or Meckle ganglion. Characteristically, the ache involves the root of the nose, the eye, the zygoma, is felt back of the ear and in the occiput. Sluder originally described this as a sphenopalatine ganglion neurosis; Vail interprets it as a Vidian neurosis. The diagnosis is made by relieving the pain with topical anaesthesia—cocaine applied to the nasal surface over Meckels ganglion or by anaesthetizing the sphenoid mucosa.

2. *Frontal headache due to contacts or closure at the entrance to the frontal sinus.*

A dull type of frontal headache usually localized over one eye, aggravated by the use of the eyes in the acts of accommodation, without significant history of infections or nasal findings, and accompanied by tenderness over the thinnest portion of the frontal sinus floor, may be relieved by shrinkage of the nasofrontal duct if to the extent of securing patency of this duct. This type of headache was first described by Sluder as due to the creation of a partial vacuum of a frontal sinus through closure of its entrance and the subsequent absorption of air, which produces a hyperaemia of the sinus mucosa. This headache is aggravated by use of the eyes because of the pull of the superior oblique muscle on the frontal sinus floor where its pulley is attached. This diagnosis of this type of headache is made certain by the relief of the discomfort which follows shrinkage of the mucosa of the nasofrontal duct. Relief is also obtained in some instances by moving the middle turbinate away from its close impaction against the lateral nasal wall. Permanent relief in some instances necessitates the removal of offending anatomical irregularities to enlarge the entrance to the sinus.

3. *Naso-ciliary Neuralgia.* (Anterior ethmoidal headache)

A third type of headache is one of very limited extent but frequent occurrence. The patient complains of pain across the bridge of the nose extending up to the superciliary ridge and laterally about to the supra-orbital notch. This is the area of distribution to the Naso-ciliary nerve. This nerve comes into the nasal fossa between the cribiform plate and frontal bone to supply sensation to the anterior superior portion of a nasal fossa. Its entrance is in the fissure-like space between the septum and ethmoidal labyrinth. Irritation may be produced by chronic hyperplastic changes in this area. By placing a topical anaesthetic in anterior superior portion of the nasal fossa, the headache is easily relieved.

DYSPHAGIA

Another symptom of special interest to the otolaryngologist, less frequently encountered than either of the two discussed, is the complaint of difficulty in swallowing which we term dysphagia. The detection of the source of this dysphagia is relatively simple and usually certain in those conditions which give positive X-ray findings. There exists a group of cases in which the

X-ray findings are usually negative and to which the diagnosis of a functional state is often attached.

In 1919 some Englishmen apparently first described a syndrome of dysphagia without organic obstruction and accompanied by anemia. In 1922 Vinson of the Mayo Clinic reported a series of these cases in which the significant findings were: anemia, usually severe and of long duration, dysphagia with negative X-ray findings, often an enlarged spleen, a smooth tongue, atrophic changes in the pharynx, and fissures at the margins of the mouth. In some of the patients endoscopic examination was made and it was noted that these atrophic changes in the pharynx extended into the esophagus, and that bleeding was easily caused by the slight trauma of the examination. Most of these cases were women in late middle age. The passage of a bougie seemed to cure them regardless of the size of the bougie. In other words, no actual dilatation was done. The diagnosis attached to these cases was "hysterical dysphagia." The supposition was, that due to nervous instability, the patient developed the idea that she could not swallow solid foods and gradually reduced her diet, with the resultant anemia from lack of proper food substance.

I have studied a number of these cases. Some have been high-strung nervous individuals with an unstable emotional make-up; others have been placid old ladies. In two cases, I have observed cicatricial changes in the nature of a slight adhesive band across the lumen of the esophagus; these were divulsed by the passage of the endoscope.

In view of the findings of atrophic pharyngitis and similar changes in the esophageal mucosa in some of these cases, the suggestion arises that perhaps a partial loss of flexibility of the esophagus due to fibrotic changes in the wall may interfere with co-ordination in the swallowing act; and that this is the real basis for this picture. An individual who is nervously unstable would have a condition more aggravated than the others.

Mosher has demonstrated recently that fibrotic changes in the lower end of the esophagus account for some cases of so called cardio spasm.

The fact that these patients are better after the passage of a small bougie does not necessarily make the functional nervous possibility an important one. I have had the experience of having a patient return to an adequate diet after explaining the cause of her trouble and reassuring her that she had no serious ailment.

Transient attacks of difficulty in swallowing occur in the individual who has what has been termed "globus hystericus." Jacobsen in 1924 reported a study of a series of these cases using a barium paste to observe the swallowing act. He suggests from this study the probability that these cases are due to a spasm of the crico-pharyngeus muscle. Jackson has held this same view.

A third group of individuals who complain of difficulty in swallowing with negative X-ray findings are those with incipient malignant disease in the lower

pharynx. This may seem like a rare condition but at present moment we have under active treatment at the Tumor Clinic of the University four individuals whose first symptom of trouble was a slight but persistent dysphagia. The usual story in the cases we see there is one of prolonged treatment with gargles and local applications before serious disease was suspected. One old lady of 73 years even had tonsillectomy advised twice to remedy a sense of fullness deep in her pharynx which had reduced her diet to semisolids and liquids.

The site of initial disease in these cases is one of three locations: in the ary-epiglottic fold, the piriform sinuses, or low on the posterior pharyngeal wall. On examination, suspicion should be aroused by any changes in contours, proliferations, or the fact that a piriform sinus fails to rid itself of mucous in the act of swallowing.

As a final comment, and this thought is probably recorded somewhere as an aphorism of some physician of the past, it seems very probable that the more we learn of disease processes and their manifestations, the more will we be able to take from the category of functional disturbances.

DISCUSSION

DR. E. HANSON: Dr. Boies has given a very clear-cut picture on the three symptoms which he mentioned. The first two particularly, I think, are of interest to most of us in any field of medicine.

As to the question of vertigo and dizziness, I think most all men who do any eye work and ear work have patients who either come of their own volition or are sent by their family physicians, or friends, because of dizziness. Very often that dizziness is really nothing more than a "giddiness" and it may be some anemic condition or it may be a matter of circulation, we may not have a true vertigo such as Dr. Boies has described.

A great many people with true vertigo as Dr. Boies said, have no local lesion as such. I mean to say they have no infectious process such as a middle ear or labyrinth infection but the symptoms are being developed by some distant focus, toxemia from an infection somewhere else or a blood infection such as lues, or a reaction to some one of the drugs.

In addition to that, the people with arterio sclerosis and increased blood pressure constitute a fairly large portion of the people who have a true vertigo.

The other symptom of headache—any man who does eye work sees a great many people who come in with one or more pairs of glasses which have been given them for headaches when the headache symptom itself does not suggest eyes at all; for instance, a person who has a headache over several days at a time or one who gets up with a headache and has it until noon, have different forms of headache which do not suggest eye strain, and these people are burdened with glasses for something that is certainly not a thing which glasses will remedy.

We have a large group of these cases, with symptoms of dizziness or even true vertigo and headache, who see the eye man or the ear man and who properly belong

in the field of the man who is doing general medicine for their general care.

DR. HANNAH: We have a lot of people coming in who complain of dizziness and it is surprising how few of these people have real dizziness as Dr. Boies pointed out. For instance, a mother brings a child in, the child is reported as having dizzy spells and it turns out that the child has epilepsy. Another person comes in and complains of dizziness and instead of dizziness it is a feeling of pressure or instead of a feeling of pressure it is a feeling of a tight band around the head. So, as we see dizziness we use that term for people who are having the sensation of objects going around and around them or they are going around and around the object.

As far as the Barany test or the caloric test to determine whether the people do have dizziness or whether it is a subjective sensation; both tests, in our experience, will give us some information as to whether the canals are functioning but if they are functioning we are just as much up against it as before.

Before you can really establish a diagnosis of brain tumor, you must not only have the dizziness but also the cochlear division of the 8th nerve involvement and also the 5th nerve involvement.

DR. MCKINLAY: Dizziness is not infrequently encountered as a symptom in hypothyroidism and is relieved by appropriate treatment with thyroid extract.

DR. BOIES: The man who is probably the best known for his work on the esophagus is Mosher of Harvard. For years he has been collecting esophageal specimens and adding to our knowledge of the factors causing dysphagia. When I was a house officer on his service, it was more or less of an unwritten law that we secure the esophagus for him in all cases coming to autopsy.

The term "cardiospasm" is a misnomer. Mosher has recently shown that the conditions which we call cardiospasm may be accounted for by evidence of fibrotic changes in the muscular coats of the esophagus and that in some of these cases extra-esophageal infection apparently has played a prominent role.

DR. K. PHELPS: I enjoyed Dr. Boies' paper very much, particularly his discussion of dysphagia. As I understand him, this so called hysterical dysphagia with anemia, enlargement of the spleen and obstruction of the upper portion of the esophagus is perhaps not hysterical. He brings out the point that it may be an atrophic or fibrinous change in the wall of the esophagus proper and I think it is a very good observation, original with him and he should be complimented on bringing it out.

The question of dysphagia due to involvement of the lower end of the esophagus brings out a lot of interesting points; for instance, what is the normal mechanism of the opening of the cardiac portion of the esophagus? There are many theories.

First, the mechanical theory. The lower portion of the esophagus takes an abrupt curve to the left, just below the diaphragm, before it meets the stomach. It twists upon itself and together with the rugae present acts much like a twisted rubber tobacco pouch. It passes by the diaphragmatic crura, through the liver tunnel

and close to the lung tip. Pathology or malformation of these structures surrounding the esophagus will cause obstruction to the lower esophagus.

Second, the nerve theory. Each wave of peristaltic contraction must be preceded by a wave of relaxation. When this relaxation does not occur at the lower end of the esophagus, closure results. In some specimens, absent or reduced nerve fibers in Aurbach and Meisners plexus have been found.

Third, the chemical theory which has few supporters but some claim that this controls the opening and closing of the cardia just as it does the pylorus.

Fourth, the muscular theory. Some believe there is a muscular sphincter at the hiatus and that failure to open is due to a spasm of the sphincter. In any event, the function of the longitudinal fibers is important in the act of swallowing. They pull up a group of the circular fibers preceding the bolus and when these contract, peristalsis proceeds.

Regardless of the cause, most cases of cardiospasm are helped by dilatation. The same applies to the upper orifice of the esophagus as Dr. Boies described.

DR. M. H. NATHANSON: I just want to say a word about the symptom dizziness. I pointed out in my thesis last year that there were reflexes arising from certain zones in the vascular tree which play an important part in regulation of the circulation. One of these reflexes arises from the carotid artery and is called the carotid sinus reflex. Upon the activity of this reflex depends to a large extent the proper distribution of blood between the cerebral and splanchnic vessels. If there is a rise of the intracarotid pressure as for example when an individual stands on his head, the reflex at once operates and produces a splanchnic dilatation thus preventing an over accumulation of blood in the brain. If there is a fall in the pressure as in the erect posture, the lowered intracarotid pressure reflexly induces a splanchnic constriction, thus preventing cerebral ischemia. In this way the cerebral circulation is protected from sudden and extreme changes in intravascular pressure.

It is probable that in some instances dizziness results from an improper functioning of this reflex. I have seen many patients who complain of attacks of dizziness. In these cases when I disturb the carotid sinus reflex artificially, altering the intracarotid pressure by applying digital pressure over the carotid artery, the patient frequently states, "This is just exactly the way I feel during one of my attacks." It is very likely therefore that at the time of the spontaneous attack of dizziness there has been functioning of the carotid sinus reflex.

CONGENITAL ANOMALIES OF THE VERTEBRA

DR. MALCOLM B. HANSON

SUMMARY: Anomalies of the spine have always been of considerable interest to the anatomist and embryologist. However, it has been only in the recent times that proper clinical importance has been attached to these abnormalities. This new interest has been aroused to a certain extent since the advent of the X-ray exam-

ination of the spine and also by the closer correlation of the clinical, X-ray and necropsy findings. It is unfortunate that most patients with anomalies of the vertebrae are seen long after complete ossification has taken place and we see only the end result of this faulty development. In these cases, our diagnosis must depend to a certain extent on our familiarity with the embryology of the spine.

Nearly all of the vertebrae are primarily ossified from three chief centers and five accessory centers. The medial or central one of the three main centers form the greater part of the body, while the other two lateral nuclei form the posterior lateral part of the body, the arch and most of the processes. The lateral centers of the upper thoracic and lower cervical vertebrae appear first; usually about the eighth week of fetal life. The first medial centers appear in the lower thoracic and upper lumbar region. The medial centers for the cervical vertebrae appear last and progress below upwardly, the upper ones appearing at about the fourth or fifth prenatal month. At birth, the bodies of the vertebrae are fairly well shaped with the exception of the upper and lower surfaces of each body is seen about the 17th year and fuse with the body by the 20th year. The costal elements for the 7th cervical, lower and upper lumbar vertebrae may arise from separate centers.

Each sacral segment has three primary centers of ossification as the other vertebrae, the medial nuclei appearing before the lateral ones. At about the fourth prenatal month there exists centers for the bodies of the upper three sacral vertebrae and lateral centers for the first body of the sacrum. At birth, little or no ossification has taken place in the last two sacral segments.

At birth the vertebrae consists of three ossifying nuclei, the body and the two halves of the vertebral arch. During the first year the halves of the arch begin to unite posteriorly, this taking place first in the lumbar region and then extending upward through the thoracic and cervical portions.

About the third year the cervical bodies and arches are united, while these do not unite in the lumbar region until the sixth year. From the sixth year on there is usually just an increase of development of the three primary centers. At the age of sixteen there appears five secondary centers, one for each of the tips of the transverse and spinous processes and one for the inferior and superior surface of the bodies of the vertebrae. These latter two are more important and fuse with the bodies at about the twenty-fifth year.

The development of the axis and atlas form two exceptions to this general rule of ossification. The atlas ossifies from two main centers for the lateral masses and a small center appearing anteriorly in the arch which unites with the lateral masses at the fourth

or fifth year. The axis begins ossification by two lateral points which appear about the 12th week prenatal. The medial center appears at five months and is usually split, but fuses soon after. The odontoid process unites at three to four years.

Anomalies of the spine may be divided into the following classes:

1. Morphological variations, including variations by suppression.
2. Numerical variations.

The most common morphological variation is spina bifida. This deformity is caused by a defective formation of the neural arch and may exist in all degrees from a mere cleft to a complete absence of the lamina. The most common noted site for this deformity is in the lower lumbar and upper sacral segment. With this defect in the lamina there may or may not exist an external tumor. The absence of a tumor does not necessarily indicate that the spina bifida is non-consequential and the resulting symptoms mild. Anterior spina bifida in which there is a longitudinal cleft in the body is an extremely rare variation and is due to the vertebral body being formed by two nuclei which do not fuse.

The accompanying signs and symptoms may be local, peripheral or both. The peripheral findings may be sensory or motor paralysis of the lower extremities, with or without trophic changes.

2. Deformities and contractures due to muscular imbalance.
3. Incontinence or weakness of bladder and rectum.

The local findings are tumor, local hypertrichosis, hemangioma and a retraction of the skin as a dimple or scar. The mere presence of a cleft in the lamina does not indicate pathological importance, and it is necessary to correlate the X-ray and clinical findings.

In the lumbo-sacral region, the next important entity due to improper fusion of the lamina, posterior articular processes and pedicle is a spondylolisthesis. This is a forward slipping of the body of one vertebra on another and takes place most frequently in the lumbo-sacral regions. In the case of lumbo-sacral spondylolisthesis it is necessary that the body of the fifth lumbar vertebra be released from its normal attachment with the sacrum. This is accomplished by a non-fusion of the pedicle which allows the upper vertebral body to slip forward with its posterior articular processes remaining intact with those below.

Another very common morphological change which might be classed under regional differentiation is non-fusion of portions of the transverse and spinous processes. This abnormality usually occurs at the junction of one section of the spine with another. The seventh cervical, first dorsal, first and fifth lumbar vertebrae are almost commonly affected. Except where these extra nuclei form exceptionally long transverse processes which may give symptoms similar to cervical ribs our main interest usually lies in the differentiation from fracture. This is usually not difficult as the borders of these apophysis are smooth and sclerotic while a fracture is irregular, shows no marginal calcium condensa-

tion and later nearly always unites with a proliferation of bony callus.

Fusion of two or more bodies of vertebrae is not a common anomaly. This most commonly occurs in the cervical region. The X-ray diagnosis lies primarily in the differentiation from an old tuberculosis with secondary fusion of the bodies of the vertebrae. In the anomalous condition, there is usually present also a fusion of the spine and sometimes the posterior articular processes.

Hemi and wedge shaped bodies of the vertebrae are relatively infrequent. They are the result of suppression of the growth of one side of the bodies. However, they form an important class as the entire statics of the spine are usually changed in those cases where they exist.

Complete and partial numerical variations are frequent. The most common location is the lumbo-sacral region where we very commonly see a partial sacralization of the fifth lumbar or a lumbarization of the first sacral segment.

SLIDES: A series of slides of feti were shown, demonstrating the ossification of the vertebrae from the fourth prenatal month up to the time of birth and also slides showing all of the anomalies of the vertebrae as seen later in life.

DISCUSSION

DR. LEO RIGLER: This is such a complete and beautifully informative paper there is very little to add to it. Anyone who has had occasion to go into court is tremendously impressed with the necessity of realizing the frequency of the anomalies of the spine.

I might add a little touch to Dr. Hanson's story about the congenital deformity of the transverse process of the cervical vertebra. I saw this film before the case came to Court. The man who had diagnosed the case as a fracture asked me if I would confirm his diagnosis. I told him it was not a fracture but a typical anomaly. I did not hear any more about it until I heard he went into Court and testified there was a fracture.

I had an occasion some years ago to see a man who is now practicing in Montana. He brought his boy here because the boy had some cyanosis and he was interested in determining whether the boy had acquired it or had some congenital heart lesion. He came to see me and I had a lateral study of the heart made which gave us a good view of the spine. There were two wedge shaped vertebrae, a typical congenital anomaly.

As I looked at that boy I looked at that doctor and remembered he always had been somewhat stoop-shouldered, so I very promptly took an X-ray of his spine, and there were also two wedge shaped vertebrae.

A little while later a doctor who is here now and who is on the Medical Service at the Panama Canal, came up here and came in to see me because he found, just as he left the hospital there, that he had been sitting across the table from a nurse who had tuberculosis. He wanted to find out whether or not he had developed an infection. He had been in contact with her for a long period of time. We took films of his

chest. He was rather short but looked normal otherwise.

In the chest films one could see the deformity in the spine; he had two or three wedge shaped vertebrae with a marked scoliosis of the spine. He was one of a pair of twins. His brother grew to fairly good size but he fell out of a haystack and that is the reason his parents gave as to why he never quite grew as tall as his twin brother.

We had occasion about six months ago to study three triplets which have been since reported in Human Biology. They apparently, as far as could be determined from clinical study, were of the identical variety. We X-rayed them from head to foot with a view to determining whether or not their growth of bones were exactly similar. We were interested in seeing that one of them had a spina bifida, the other two did not. We have felt therefore that this type of anomaly was not genetic in origin; it occurs as an acquired thing, probably intrauterine, but nevertheless, acquired.

One more case occurs to me and that is a case that Dr. Evans saw some years ago—a girl who was apparently fairly well except that she began to develop a lump in her back. When this knuckle appeared in her back she was taken to a doctor who thought she had t.b. of the spine. She was sent to Glen Lake with that diagnosis.

She was X-rayed there and they found that she did not have t.b. but she had to stay there quite a while as is very often the case. This girl simply had one of the wedge shaped vertebra which Dr. Hanson showed which had gradually developed to the point of producing a knuckle deformity.

We run into this thing not infrequently. The most important thing about the congenital anomalies of the spine is to know that it is there and not make a diagnosis of a fracture, tuberculosis or other disease.

DR. E. T. EVANS: I was very interested in this summary of the development of the spine from a roentgenological standpoint. There has been a good deal of interest in this subject on the part of the orthopaedists, as shown by the numerous articles appearing in the literature, notable among which is the work of Dr. Willis of Western Reserve.

There is a good deal of question as to just what the clinical significance of congenital anomalies, in the obscure cases, might be. The occasional occurrence of cord bladder with occult spina bifida is, of course, familiar to you. We see associated congenital lesions frequently enough to warrant the taking of lumbosacral plates in all cases of club foot, especially in those cases associated with obvious paralytic conditions of the peroneal muscles. We also see delayed onset of club feet due to lesions in the cauda equina secondary to occult spina bifida. The association of congenital dislocation of the hip with these anomalies of the spine is not so frequent.

With reference to the case Dr. Rigler mentioned, that of wedge vertebra, this girl came to me after having had a prolonged period of recumbency with a diagnosis of Pott's Disease. In view of the absence of other clinical

evidence of tuberculosis, she was discharged from another institution and Dr. Rigler's X-rays for the first time revealed definitely an anomalous hemi vertebra. The parents were advised that the child should have a spine fusion to prevent progression of the kyphoscoliosis. This they refused and I warned them against allowing the child to have too much activity, lest a compression paraplegia result. Within three days the parents brought the child back with a compression paraplegia. She was immediately admitted to the hospital where, under traction, paralysis disappeared and the parents were then only too willing to have spine fusion performed. This was done, as Dr. Rigler stated, with excellent recovery.

In conclusion, I believe the attention of all clinicians can be wisely drawn to the roentgenological aspects, but their interpretation and treatment from a clinical standpoint must be based upon all the aspects of the case.

DR. M. B. HANSON: I would like to ask Dr. Rigler how old were these triplets. There have been cases reported with marked delayed union of the lamina even as late as eight years.

DR. LEO RIGLER: They were eight years old.

The meeting adjourned.

JAMES K. ANDERSON,
Secretary pro-tem.

SOCIETIES

Regional Conference, Lowry Hotel, St. Paul,
Minnesota

February 19, 1933

PRESIDENT

J. F. D. Cook, M.D., Secretary-Treasurer, South
Dakota State Medical Association

SECRETARY

E. A. Meyerding, M.D., Secretary, Minnesota State
Medical Association

8:30 A.M.—Breakfast. Informal discussion.

9:30 A.M.—“Credit Reference,” Mr. A. W. Wilson,
St. Paul.

10:00 A.M.—“Care of the Indigent,” Dr. George B.
Larson, Secretary, Polk County Medical Society,
Frederic, Wis., and Dr. R. L. Parker, Secretary,
Iowa State Medical Society, Des Moines, Iowa.

10:30 A.M.—“The Milwaukee Plan,” Dr. Theodore
Wiprud, Secretary, Milwaukee County Medical
Society.

11:00 A.M.—“The Oversupply of Physicians,” Dr.
N. O. Pearce, President, Minnesota State Medi-
cal Association, Minneapolis.

11:30 A.M.—“Should Medical Schools Practice Medi-
cine?” Dr. R. H. Jackson, President, State Medi-
cal Society of Wisconsin, and Dr. R. E. Scammon,
Dean of Medical Sciences, University of Minne-
sota.

12:00 M.—The report of the Committee on the Costs
of Medical Care. General discussion opened by
Dr. W. C. Woodward, Chicago, Director of the

Bureau of Legal Medicine and Legislation,
A. M. A.

1:00 P.M.—Dinner.

2:00 P.M.—“Health Insurance and Corporation Prac-
tice,” Dr. W. C. Woodward, Chicago.

2:30 P.M.—“Our Medical Journal—Its Purpose and
How It Should Be Financed,” Mr. F. S. Crockett,
West LaFayette, Ind., and Dr. George Crownhart,
Secretary, State Medical Society of Wisconsin.

3:30 P.M.—“Legislation,” Dr. John R. Neal, Presi-
dent, Illinois Medical Society.

“How It Should Be Conducted; Special Legisla-
tion in 1933,” Dr. B. F. Bailey, Lincoln, Neb.

“Veterans' Legislation; Cost of Legislation,” Dr.
P. H. Burton, President, North Dakota State
Medical Association, Fargo.

“What Should the A. M. A. Do to Assist the
States?” Dr. J. R. Westaby, President, South
Dakota State Medical Association, Madison.

“What Should the States Do to Assist the
A. M. A.?” Dr. H. M. Johnson, Dawson, Minn.;
Dr. C. B. Wright, Minneapolis; Dr. W. C. Wood-
ward, Chicago; Dr. H. M. Camp, Secretary,
Illinois State Medical Association, Monmouth.

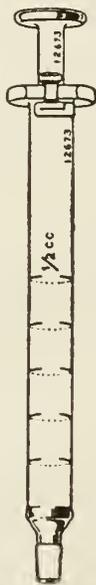
MISCELLANEOUS

A NEW SYRINGE FOR TUBERCULIN TESTING

The intradermal injection of substances, primarily for the purpose of determining sensitization, has brought on the market many types of syringes. The administration of numerous substances for the determination of sensitization in asthma and hay fever sufferers, the administration of diphtheria toxin, the administration of scarlet fever streptococcal toxin to determine susceptibility or immunization, and the administration of tuberculin to determine sensitization or an allergic state have become in recent years universally accepted processes.

It has been discovered on repeated studies that for accuracy in determining sensitization or immunity, accuracy in dosage is highly important. In injecting between the layers of the skin, through the hypodermic needle, a measured quantity of a substance, accuracy within a two per cent variation must be achieved. A study of many syringes offered for this method of skin testing showed a variable as high as twenty per cent, due in part to the inaccuracy of graduation marks but in a greater measure to the inaccuracies of the operator in endeavoring to measure with the eye a minute volume of the substance

to be injected because the syringe barrel being used was inconveniently graduated. Some of the syringes studied were bulky, others were too long and inconvenient to handle, and the majority in certain lights projected a shadow from the graduation marking to the piston resulting in confused readings and inaccurate doses.



As tuberculin testing has come more and more into use, application of tuberculin by the intradermal method has been delegated to qualified persons other than physicians. In order to remove as much as possible the dangers of inaccuracy, a particular syringe has been devised by Dr. F. E. Harrington, Commissioner of Health of Minneapolis, and Director of Lymanhurst School for Tuberculous Children. It is a simple Luer-type syringe, graduated accurately within two per cent variation in 1/10 cc. markings, with a capacity of 1/2 cc. The lumen of the barrel is small, permitting a space of reasonable width between 1/10 cc. graduations. The graduation marks do not completely encircle the barrel, leaving an open space through which the tip of the piston, which is colored blue, can easily be seen. The syringe is sufficiently short to be conveniently handled, and after the insertion of the needle the required injection of 1/10 cc. can be made by pushing the piston from one graduation to the next, the travel of the piston being read at the broken space between the ends of the graduation marks. In this way a reasonably accurate volume is delivered without confusion by intermediate graduation marks of 1/20 or 1/100 which frequently appear on other serum syringes. The plunger or piston end can be carried from one graduation mark to the other without confusing shadows. In the hands of the personnel of the Division of Public Health, Minneapolis, making several hundred Mantoux tests a month, this syringe has proven all of the points claimed for it.

To meet the possible objections offered by manufacturers of material for Mantoux skin tests where the recommended dosage is 1/20 cc., their particular material is diluted with an equal quantity of normal salt solution, bringing the dilution to the point that 1/10 cc. equals the same quantity of substance. In this manner the resultant bleb is always the same size.

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. B. Carlson, formerly in practice at Minneapolis, is now located at Warren, Minn.

Dr. H. L. Marsh, has sold his practice at Esteline, S. D., and is now located at Flint, Mich.

Dr. Geo. E. Johnson, has moved from Avon to Yankton, S. D., and opened offices for general practice.

Dr. H. T. Norrgard has sold his practice to Dr. F. R. Werner, at Milaca, Minn., and is now located at Duluth.

Dr. J. D. Mueller, a graduate of the South Dakota University, has opened offices for general practice at Flandreau, S. D.

Dr. Carl F. Carlson, a graduate of the Rush Medical School in 1931 has opened offices for general practice at Stephen, Minn.

Dr. C. J. Wallace, who has been in active practice at Duluth, for over twenty years, is now located at Two Harbors, Minn.

Dr. Hiram C. Shouse, one of the pioneer physicians of Plankinton, S. D., died on January 19th, at the advanced age of 90 years.

Dr. E. A. LeBein, McHenry, N. D., died at a Valley City hospital, from the effects of a severe attack of pneumonia on Feb. 5th.

Dr. W. F. Maertz, New Prague, Minn., has been appointed a member of the Radio Commission of the Minnesota Medical Association.

Drs. Wm. Campbell and A. W. Macdonald, Valley City, N. D., have dissolved partnership, but both physicians will continue their practice in that city.

Dr. S. Z. Kerlan, Aitkin, and Dr. E. S. Plateau, Minneapolis, have been named members of the State Board of Health, and will start active service at once.

Dr. El. H. Simms, has been secured as a permanent physician to locate in Roscoe, S. D., as this vicinity have been without a doctor for some months.

A new hospital with a capacity of about twenty rooms has been opened at Alcester S. D., with Dr. G. E. Johnson, formerly of Gregory, as superintendent.

Dr. O. M. Porter, Sisseton, S. D., had the misfortune to freeze both feet, while visiting one of his patients during the extreme cold weather in North Dakota.

Dr. F. W. Davis, a well known and much beloved physician of Austin, Minn., died recently. Dr. Davis had suffered for many months with cancer trouble.

Dr. F. O. Hanson, former superintendent of Lutheran Hospital, Des Moines, Iowa, will succeed Mr. Wm. Mills at the Swedish Hospital, Minneapolis, March 1.

Dr. J. D. Windell, well known as one of the pioneer physicians of Park River, N. D., died at

his home in Spokane, Wash., last month. His death was caused by a paralytic stroke.

Dr. Henry C. Sweany, Medical Director of Research at the Municipal Tuberculosis Sanitarium, Chicago, was the guest speaker at the Hennepin County Medical Society this month.

Physicians would be permitted to prescribe as little as a drink of whisky in their offices, and to possess liquor in their offices, under the terms of a bill recently passed by the Minnesota legislature.

Dr. Hugh J. Tunstead, has been elected president of the Eitel Hospital staff of Minneapolis, with Dr. G. J. Thomas, vice-president, Dr. T. J. Devereaux, secretary and A. G. Stasel, superintendent.

The Minnesota Hospital Association will hold their annual meeting at the Curtis Hotel, Minneapolis, on May 25 and 26th. Supt. J. G. Norby, president of the association is in charge of the program.

Dr. P. L. Gifford who has been in practice for a short time at Luverne, is now located at Hewitt, Minn., where he purchased the practice of Dr. Laney. Dr. Gifford is a University of Minnesota graduate.

Drs. S. M. Hohf, F. C. Smith, F. A. Moore and J. A. Hohf of Yankton, S. D., were in attendance at the annual meeting of the Sioux Valley Medical Society, held at Sioux City, Iowa last month.

Dr. T. N. Kittleson, Fergus Falls, Minn., who died recently, left an estate of \$150,000, and among the special requests was one of \$20,000 to be used for the care of poor and needy patients of that city.

Three St. Paul physicians were elected to membership in the American College of Physicians at the annual meeting recently held at Montreal. The doctors were: A. S. Anderson, F. B. Morrissey and B. B. Souster.

The Upper Mississippi Medical Society held their annual meeting at Crosby, Minn., and elected the following officers: Dr. S. S. Shannon, president; Dr. J. A. Thabes, Jr., vice-president; and Dr. G. I. Badaux, secretary.

At the annual meeting of the District Medical Society, held at Watertown, S. D., officers for the coming year were elected as follows: Dr. A. E. Johnson, president; Dr. H. M. Freeburg, vice-president; and Dr. M. C. Jorgenson, secretary.

Dr. J. A. Myers, Minneapolis, chairman of the board of editors of THE JOURNAL LANCET,

was a speaker before the Pennsylvania Tuberculosis Society, Lancaster, Pa., and the Indiana State Health Council at Indianapolis, last month.

Dr. Martin Nordland, Minneapolis, was the guest speaker before the members of the Eau Claire, Wis., Medical Society on the evening of January 30th. Dr. Nordland presented a paper on "Problems in the Diagnosis and Treatment of Goitre."

Dr. Clifford C. Leck, Austin, Minn., who had been in active practice in that city for nearly thirty years, died suddenly while on a visit to Excelsior Springs, Mo., last month. Dr. Leck was a graduate of the University of Minnesota in the class of 1900.

Dr. Eivnid Klaveness, St. Paul, was the guest speaker at the last meeting of the Stearns-Benton Medical Society held at St. Cloud last month. Mrs. Klaveness accompanied the doctor on the trip, and died at the hospital from a sudden attack of heart trouble.

"Unreal phenomena and their relations to auditory tests" was the subject of an address by Dr. A. J. Pohlman, dean of the South Dakota school of medicine, before the eye and ear academy of the Sioux Valley medical meeting held in Sioux City, January 24 and 25.

The eleventh annual Formal Foundation dinner of the Minneapolis Surgical Society, was held at the Minneapolis club on Thursday evening, February 2nd, with Dr. John W. Yates, Milwaukee, as guest speaker. It was a very interesting meeting, about 100 members being present.

At the annual meeting of the District Medical Society held at Huron, S. D., last month, all of the old officers were re-elected for the year 1933. Committees were named and plans are being prepared for the entertainment for the annual meeting of the State Medical Association, which will be held in that city, May 23, 24 and 25.

At a recent meeting of the Officers and Councillors of the North Dakota State Medical Society held at Fargo, the following resolutions were passed. The Councillors go on record that they are absolutely opposed to that type of so-called contract practice covering sickness insurance where the agents solicit membership from the public, yet where no previous medical examinations have been made, nor where the requirements for membership in such sick benefit societies do not require a properly approved medical examination as necessary for such membership.

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Pericarditis With Effusion*

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IT WOULD seem at first sight to be a bold man who would venture to write on the topic such as forms the caption of this paper.

I hope, however, to abundantly justify the need for constantly bringing to the attention particularly of the general practitioner, some of the points of this disease.

To begin with pericarditis in general is at once one of the easiest and one of the most difficult diseases to recognize.

In a young individual who has perhaps an inflammatory rheumatism with an acute endocarditis, and who is in bed under treatment for these conditions, it is hardly conceivable that a pericardial effusion should be overlooked. Or at least so it would seem and yet I could cite a dozen cases which have come under my own observation where just this thing happened, because of reasons which I shall discuss later. On the other hand when the patient is first seen with a moderate effusion and when the cardiac sounds are still reasonably loud the diagnosis of the effusion is frequently so difficult as to tax the diagnostic resources of the most skilled. A dozen or more years ago an investigation of one of our large American hospitals, the staff of which was made up of men of recognized ability,

disclosed that nearly fifty per cent of the cases of pericardial effusion which had come to autopsy in the few years preceding this time had not been recognized *intra vitam*. While it may be true that at that time portable chest plates were less frequently taken than they are now, I hope to be able to show you that the main trouble in failing to make such a diagnosis lies not only in the inherent difficulty in the diagnosis but in the fact that it was not suspected and carefully looked for.

With these few preliminary remarks let us take up the question as to the conditions under which pericardial effusion arises. I need not go into the diseases at great length but suffice it to say that in the course of inflammatory rheumatism, chorea, endocarditis, pneumonia and less frequently a large variety of other infections, pericardial exudates may develop. The more chronic forms of pericarditis are seen more frequently as a result of tuberculosis, and in my own experience by far the greater number of the very large exudates have been of a tubercular nature.

LOCATION OF THE FLUID

In the text books of a decade or two ago a good deal of attention was devoted to the question as to the relationship of the heart and the fluid. Statements were made to the effect that the heart was covered up by the fluid; other statements were made that the heart, being of

*Written especially for the "Heart Number" of THE JOURNAL-LANCET.

†THE JOURNAL-LANCET regrets to advise its readers of the death of Dr. Williamson.

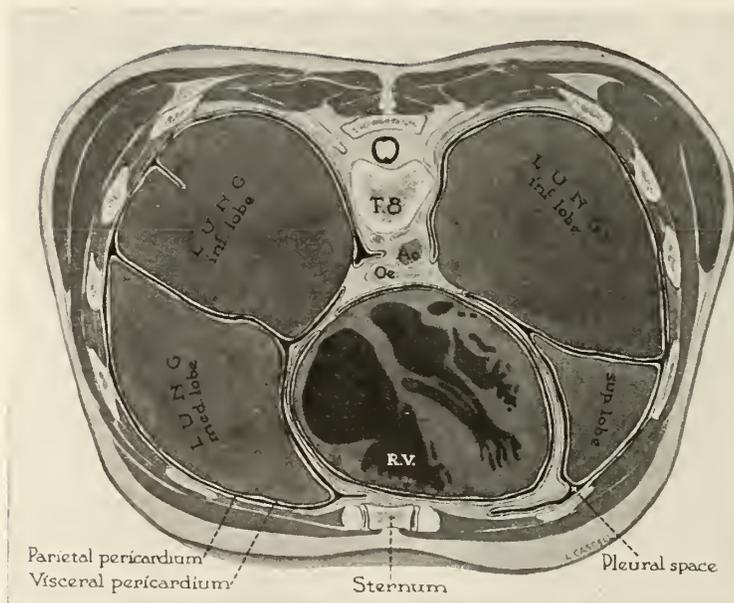


FIGURE 1

Cross section of normal chest to show relations of heart, pericardium, mediastinum, and lungs.

a heavier specific gravity than the fluid, sank as it were to the bottom. When it is considered that the heart is, in a very real sense rather firmly fixed by the great vessels which empty the blood into it or carry the blood out of it, a very little reflection must make it clear that the only part of the heart which is free to move is the apex. A little further consideration will show that when the apex moves upward it also moves outward and when it moves downward it moves inward. If one pictures to himself the arc of a circle having the second right costosternal junction as a center and the distance from this point to the apex as a radius, he will have a fair idea of this movement. In other words the point named may be regarded as the point of maximum fixation of the the base of the heart by the great vessels entering and leaving it.

As a matter of fact in most cases of pericardial effusion the *apex stays in its normal position* and neither sinks or swims in the sense of the older authors. Some years ago we undertook some experimental injections of the pericardium to see what the relationship of the fluid to the heart was. In fresh cadavers a small incision was made in the abdomen and through a small trocar passed up into the pericardium just behind the sternum into the pericardial sac, injections of a gelatin-agar solution were made of about the same specific gravity as pericardial fluid when nearly cool. The injections were made hot, the body put away in the cooler for twenty-four hours and then after tying off the great ves-

sels the heart and pericardium were removed en bloc. An expert modeler then made a model and cast of the entire pericardial sac, a second model of the heart and a third model of the exudate. I need not go into the results of these experiments in detail but certain points were elicited which are very important to bear in mind in the diagnosis of this disease. Some of these conclusions were:

1. In pericardial effusion the fluid accumulates first along the lower margin of the heart and about the apex, particularly on the diaphragmatic surface of the heart. With small effusions this is the only place in which fluid accumulates with regularity.

2. The results of the accumulation of the fluid in this position

is to push down the left lobe of the liver. This was demonstrable in almost every case where the amount of the injection was considerable.

3. The second place in which fluid accumulates is over the great vessels at the base. With small effusions it is only occasionally present in sufficient amount to be detected by percussion. With medium sized effusion this layer is generally thick enough to be demonstrable by percussion behind the sternum and at the left sternal edge in the second interspace.

4. With both small and medium sized exudates we were neither able satisfactorily to demonstrate percussion dullness in the fifth right interspace nor could a rounding of the cardiohepatic angle be made out.

5. In nearly half of the thirty-three cases injected the anterior surface of the heart remained in part uncovered by the fluid. This is another way of saying that in such cases the visceral and parietal surfaces of the pericardium would have been in contact and under these circumstances a pericardial friction rub would probably have existed. This persistence of the pericardial rub is to be anticipated in cases in which the heart is relatively large, so that it fills out the space between the vertebral column and the sternum.

6. From the standpoint of most readily reaching small amounts of fluid the most appropriate sites for puncturing are either just outside the apex or in the chondroxyphoid angle.

Let us take up these conclusions seriatim. With small exudates, meaning by this those of

the size of three hundred to four hundred cubic centimeters, the fluid accumulated almost entirely in the angle formed by the chest wall and the diaphragm, extending over to the apex. Now if this is visualized it will be seen that this can hardly be made out by percussion since the absolute flatness of the heart merges into the flatness of the exudate and that of the liver. This behavior of the fluid shows why it is very difficult with the X-ray to make out these effusions since the shadow of the heart, the fluid exudate along this lower margin and the liver all merge one into the other. With larger exudates of six hundred and seven hundred cubic centimeters in which the right border of the pericardial sac becomes distended and when the fluid reaches up to the base filling out the complementary space especially along the sternum and along the second left interspace, the X-ray picture becomes more characteristic especially if the shadow in the second left interspace disappears when the patient is in the erect position. This behavior of the shadow is regarded by many roentgenologists as the most characteristic roentgen diagnostic point but it should be carefully noted that it does not occur with small exudates nor again with very large ones, since with these latter the amount of fluid is so great as to distend this portion of the sac when the patient is sitting up. On the other hand with large effusions, of a liter or more, the failure to recognise pulsation on thorough fluoroscopic examination is generally fairly diagnostic of a large effusion as distinguished from a great dilatation of the heart. Here again, however, mistakes are made even by experienced roentgenologists.

One of the most important points in the behavior of the fluid is dependent upon the rapidity with which the exudate is poured out into the pericardial sac. I need hardly remind you of the fact that this sac is of a very strong fibrous nature which can withstand great pressure without stretching. Indeed some authors hold that it is one of the functions of the pericardial sac to prevent or at least to assist in preventing too great distention of the heart. In pericarditis, however, the pathological condition is quite different. The wall of the sac, as a result of the

inflammatory change becomes softened, its fibers pushed apart and the whole fibrous structure becomes less resistant to stretching. The net result of this is that the more gradually the exudate takes place the more time is given to the inflammatory process to infiltrate the fibrous portion of the sac and in consequence it stretches more readily. The more acutely the exudate occurs the less the pericardial sac distends. Now the pressure within the pericardial sac is, after all is said and done the one all important factor in determining the outcome of the case.

To justify this statement I shall have to go back to some physiological experiments which were made by Francois-Franck in France and by Starling in England. These observers and particularly the first showed, that by attaching an oil manometer in the pericardium of the living dog when the pressure within the pericardial sac reached that which existed in the vena cava or right auricle the effect was to obliterate the auricle and thus prevent blood from entering the heart and thus effectually putting an end to the circulation. If the manometer were lowered only a very little bit so that the pressure in the sac was less than that in the cava and auricle the circulation would start up again at once. Starling writing thirty years later confirmed this work and elaborated it.

In the hope of obtaining more precise data on this subject the author together with Ets carried out some similar experiments to which brief ref-

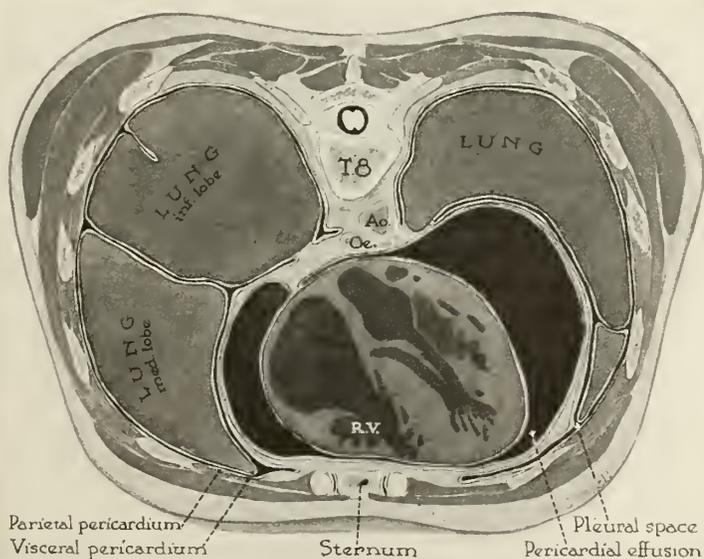


FIGURE 2

Cross section through a chest with a moderate sized pericardial effusion. Note especially the small amount of fluid directly in front of the heart and the manner in which the effusion compresses the left lung.

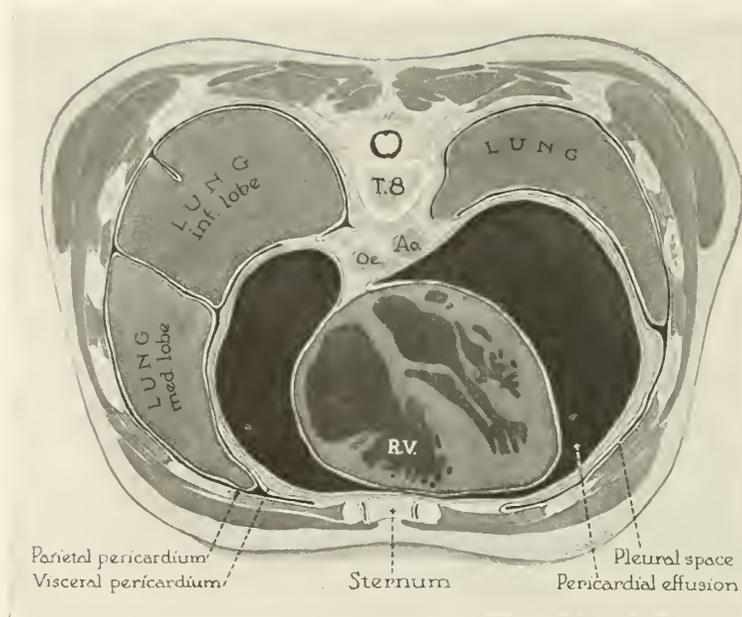


FIGURE 3

Cross section through a chest with a larger pericardial effusion extending backward, both right and left, the outline somewhat resembling a pair of water wings. The effusion on the left side is always greater, giving rise to compression of the lung and producing the so-called "Bamberger" or "Broadbent" sign.

erence here may be made. Under light ether anesthesia, in tracheotomized dogs, a cannula was inserted in the left carotid artery and another in the left jugular vein in such a manner that the arterial and venous pressure could be recorded by means of manometers writing on a smoked drum. A vertical incision between the ribs on the left side exposed the heart, artificial respiration was instituted of course as soon as the thoracic cavity was opened. A T tube cannula was then tied into the pericardium and connected with a manometer writing on a smoked drum and also with a leveling bulb. Warm physiologic sodium chloride solution was used to produce pressure in the pericardium and this pressure could be regulated by means of a leveling bulb. Water was used in both the pericardial and venous manometer and mercury in the arterial. It should be noted that the venous cannula was tied in the veins centrally so that the venous pressures recorded are not exactly comparable to those which might be clinically observed. Each experiment began by taking a record of both arterial and venous pressures before raising the intra-pericardial pressure. The latter was then gradually raised by elevating the leveling bulb. Finally a point was reached when the intra-pericardial pressure became so great that the heart stopped, but at this point if the bulb was quickly depressed so that this pressure was rapidly reduced, the heart would again resume its normal action. It is

worthy of note that in every experiment the increase in pericardial pressure caused a *steady rise in the venous* and a *steady fall in the arterial pressure*. A time marker enabled us to record the time relations during the various experiments. In a few of these the incision over the heart was closed and the dog respired naturally, that is, without artificial respiration. As no difference was noted in the latter experiments, artificial respiration was generally employed. It is not possible within the limits of a short article such as this to quote more fully from this work¹, but suffice it to say that in each of the thirteen experiments made the results were identical. A raising of the intra-pericardial pressure produces a steady lowering of the arterial pressure in the carotid and a rise of the venous pressure in the jugular. Now

it must be perfectly obvious that this is exactly what goes on in a case of clinical pericarditis with effusion. If the effusion is poured out sufficiently rapidly so that the sac offers a great resistance to distention, the intrapericardial pressure rises, the flow of blood into the heart is interfered with, the venous pressure rises and the arterial pressure drops. In effusions of average size and which occur with average speed this is not a matter of great moment. If, however, the effusion occurs too rapidly for the sac to soften and readily distend itself, then the pressure goes up to dangerous limits. Unfortunately this is almost impossible of recognition clinically, since as long as the pressure in the sac does not exceed the pressure in the vena cava and right auricle the circulation of blood is not greatly interfered with. When, however, this point is reached the flow of blood in the right heart is suddenly stopped, and the patient dies very suddenly.

While conducting these experiments I was naturally on the lookout for cases of pericarditis and one of these illustrates these various points so well that I can not do better than to quote it briefly.

CASE I

The patient was admitted late one evening to the hospital and was seen by my interne who believed that he had a pericardial effusion. The following morning he called me at my office to say that he could hear a to and fro rub all over the

front of the heart but that he felt that the signs of effusion were quite definite. I arranged to see the patient that afternoon. At about one o'clock my interne again called me saying that the patient's pulse had suddenly grown much weaker. I went out to the hospital immediately and found that his observations were accurate although the patient still looked in fair shape in spite of the rather weak pulse. A needle was hastily boiled and just as we were preparing to aspirate the pericardium the patient died suddenly. The family who were present had given consent for an autopsy and so I carried out on this patient, known as experiment twenty-seven², the following experiment. A few minutes after death we aspirated all the fluid we could obtain and immediately replaced this fluid which amounted to two hundred and seventy cubic centimeters with the same amount of the gelatin-agar solution referred to. Twenty-four hours after when this had thoroughly hardened, the pericardial sac, and the great vessels were removed and a cast made of these in the manner referred to above. We determined the volume of the exudates as represented by the casts by the water displacement method and this amounted to four hundred and five cubic centimeters showing that, as might have been expected, that we had not been able to aspirate all the fluid but had left approximately one-fourth. I regard this case as a peculiarly instructive one in that the pressure conditions were exactly the same as they were during life. From an inspection of this cast the great veins and auricles especially were seen to be flattened out and this must have been their condition in the last moments of life. *I think there can be no question of doubt that the sudden death in this and similar cases was actually the result of excessive pressure in the sac, and had this fluid been aspirated the pressure factor at least would have been removed and the patient's chances of recovery immeasurably improved.*

While this is the only patient in whom I have had the good fortune to obtain an injection of this sort immediately after death I have had three other patients with pericardial effusion in whom for lack of a timely aspiration sudden death occurred.

Indeed, this sudden death is so characteristic in these pericardial exudates that I have taken the liberty of coining the term "pericardial death." Of course this term is only applicable to uncomplicated or substantially uncomplicated cases of pericardial effusion in which death is due to excessive intra-pericardial pressure and in these cases sudden death is typical and it should be well

noted that it is in exactly this group of cases that a timely aspiration, repeated if necessary, may prove to be *life-saving*.

FINDINGS ON PHYSICAL EXAMINATION

A very great deal has been written on this subject and much of it is hardly germane to the subject. To begin with, in most cases of pericarditis the practitioner sees the case either before there is any effusion at all or when the effusion is very slight. In both of these instances a pericardial rub is almost always present if carefully looked for. We need not dilate upon the character of this rub excepting to say that it may be soft in quality or again harsh and squeaking. The most important thing about it is that it is not strictly synchronous with the systole and diastole of the heart. It may commence a little before or a little after the systole and is generally influenced somewhat by firm pressure of the stethoscope bell, which makes it louder. It is, of course, almost uninfluenced by respiration. A very little attention to these points make the diagnosis of a pericardial rub from an endocardial murmur quite simple. The next point to be mentioned is, how-

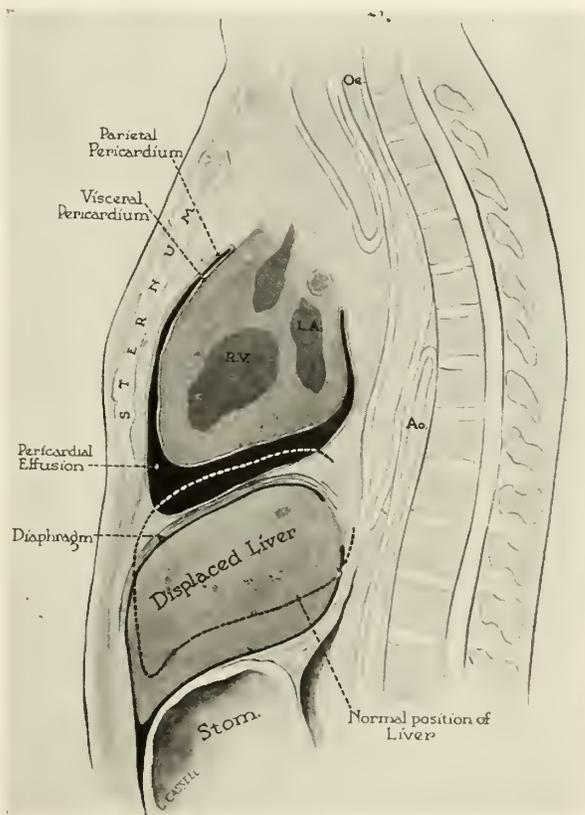


FIGURE 4

Longitudinal sections through the body showing the position assumed by a pericardial effusion of moderate size. Note particularly the way in which the liver is tilted downward.



FIGURE 5

X-ray plate showing a moderate sized pericardial effusion.

ever, far from simple. It is generally assumed and frequently taught that as long as the friction rub can be heard, there can be no considerable amount of fluid exudate present in the pericardial sac. This assumption has been shown to be wrong not only by our experimental work but also by a large number of recorded cases in which, despite the presence of a large fluid exudate a pericardial rub could be heard up to the moment of death. These are the cases in which the autopsy discloses to the astonished physician that, in spite of his having heard the rub, a large and totally unsuspected exudate was present. Furthermore these are the cases which are often real tragedies in that many of them might have been saved had a timely aspiration been made. Let me again call your attention to the underlying reasons for the persistence of a rub over the front of the cardiac area even when effusions as large as a liter or even more are present. The reason is mostly to be found in the relatively large size of the heart as compared with the antero-posterior diameter of the thorax. In other words, with a heart which fills the antero-posterior diameter of the chest there is little or no room for a fluid accumulation between the heart and the posterior aspect of the anterior chest wall. Curschmann called attention to this nearly forty years ago but his warning made but little impression on the medical writers of a later date. Thayer re-

corded a case a number of years ago in which with a very large exudate a friction rub could be heard throughout the course of the disease. Despite his unquestioned authority in matters pertaining to the heart this observation seemed to make very little impression. Far from being an unusual occurrence it is very common to have an audible rub heard throughout the entire course of the disease with effusions as large as thirteen hundred or fourteen hundred cubic centimeters. The first point in physical examination is that *the physician should divest himself of the idea that the presence of a rub means absence of fluid.*

The next point to take up is the outline of percussion dullness. This is of course roughly proportional to the size of the exudate but the most important place to seek for it is along the left border of the sternum in the second intercostal space forming a so-called "Schornstein-Forsatz" process of the German authors, so-called because some imaginative physician thought that this rectangular area of dullness resembled a chimney. If the area of dullness in this locality can be demonstrated only when the patient is lying down and disappears or becomes markedly less when the patient sits bolt upright the diagnostic significance becomes greatly increased. The next physical sign to be described depends upon the fact that with rather large effusions, as Curschmann pointed out long ago the pericardial sac distends backward especially on the left side as shown in the plates. In so doing it compresses the left lung and if this compression be sufficiently great produces a dullness with bronchial breathing near the angle of the scapula, a sign which was described by Bamberger and later by Broadbent. It is this condition of affairs which has led in many instances to the diagnosis of a pneumonic consolidation or a pleural effusion. Indeed many times a needle has been put in the chest wall posteriorly on the assumption that there was pleural fluid, with the result that the pericardium has been opened from behind. Indeed at least one author considers this a good place to tap the pericardium under these conditions, an opinion in which, however, we cannot concur. The next point in physical examination relates to the behaviour of the left lobe of the liver. Auenbrugger called attention to the fact that the liver was pushed down by large pericardial effusions but his observations met with little acceptance. We have called attention in several communications to this undoubted fact, and in the experimental work already referred to we called attention to the fact that effusions as small as six hundred cubic centi-

meters would depress the left lobe of the liver a good finger's breadth. Since first calling attention to this we have paid especial attention to this sign and under appropriate conditions we regard it as a valuable diagnostic point. "By appropriate conditions," is meant cases in which the liver is not enlarged as a result of venous stasis from a complicating myocardial insufficiency. In the presence of the latter it is likely to prove impossible to say whether the liver is enlarged or whether the left border of the liver is pushed down by the effusion.

In a case which has been in the Research and Educational Hospital within the last year I had the opportunity of demonstrating to the resident staff and to the students this depression of the liver in the most striking fashion. After having made the diagnosis of the fairly sizable pericardial exudate we outlined the liver, carefully, marked the position of the edge of the left lobe, and then removed a little less than a liter from the pericardial sac by aspiration. Immediately the liver boundary went up a full inch. Unfortunately this did not relieve the patient permanently and about a week later a second tapping was undertaken and this time somewhat more than a liter was removed, and immediately the liver border, which in the meantime has been pushed down to a point a little below where we had located it prior to the first tapping went up again a full inch and one-half. Our personal belief is that the reason this sign has not met with greater acceptance is that it is confused with the enlargement of the liver which occurs so often from a concomitant venous stasis.

To a careful observer, perhaps the most important clinical sign of all is the gradual disappearance of the apex beat. A typical condition of affairs is as follows:

To begin with, the apex is of normal intensity. Day by day it becomes less pronounced or perhaps grows somewhat wavy and simultaneously with this the sounds at the apex grow more and more distant. This should always put the physician on his guard. Some years ago we were called in consultation to see a young man in whom the diagnosis had been made by a previous consultant of an enormously dilated heart. The X-ray diagnosis was also an enormously dilated heart but the physician who had charge of the case was suspicious and asked us to see the patient with him. We removed nearly sixteen hundred cubic centimeters of a somewhat turbid fluid which when inoculated into a guinea pig proved to be of a tubercular nature. A few weeks later we removed as much again. A very striking in-

cident occurred in the course of the aspiration. On the occasion of the first consultation not having been told what to expect, we found nothing better at the hospital than a very moderate sized needle and syringe. With these the aspiration was undertaken and it proceeded, of course, rather slowly. After the removal of not more than a hundred and fifty cubic centimeters the patient stretched himself and said, "My, but that feels good." In the light of what we have already said about the critical pressure obstructing the flow of the blood in the right auricle, it is easily comprehensible that the removal of even so small a quantity as one hundred and fifty cubic centimeters would again permit a good flow of blood into the right auricle from the peripheral veins and thus improve the circulation of blood immediately. It seems to one not familiar with the situation, very remarkable, that a well qualified consultant should overlook a large effusion, but we can vouch for the fact that it can very easily happen. We happened once to be present at the autopsy on a patient who had been operated on for some pelvic condition and subsequently developed a weak pulse and an apparently dilated heart. Three nationally known surgeons had seen the case in consultation and decided that aside from the administration of digitalis there was nothing to do for what they supposed to be a huge cardiac dilation. Imagine their surprise when at autopsy a practically normal heart was found with a huge pericardial effusion which had pushed the liver down a couple of inches. I mention this not with any thought of criticism but because I believe that the diagnosis of pericarditis at times is one of great difficulty, and even the great development of X-ray technique in the last few years has not helped as much as it should, for the very simple reason that in the absence of a pericardial rub and with the cardiac sounds very weak the diagnosis of dilatation of the heart is only too often erroneously made.

DIAGNOSIS

In view of what has already been said the important diagnostic points may be briefly summed up:

(a) A to and fro friction rub not strictly synchronous with the systole, and diastole and generally heard over the mid-sternum.

(b) Enlargement of the percussion dullness particularly a well marked dullness in the second interspace at the left edge of the sternum. This is more valuable if it disappears when the patient sits erect.

(c) Progressive enlargement of the cardiac

dullness to the right and left. This is to receive a special weight if the size of the heart dullness seems out of proportion to the amount of cardiac embarrassment.

(d) Gradual weakening of the tone at the apex.

(e) Pushing down on the left lobe of the liver to the extent of one or two fingers breadth. This sign is valuable only when there is no venous stasis of the liver.

(f) With large exudates the development of the dullness frequently bronchial breathing on the left side of the posterior.

(g) Perhaps the most important point in the diagnosis is to remember that a pericardial effusion may make very few subjective symptoms and must be sought for if the diagnosis is to be made. The presence of a rub is by no means to be regarded as indicating that fluid, even in considerable amounts, may not be present.

TREATMENT

In the great majority of cases of pericarditis either without fluid or with small effusions the treatment need not be anything more than symptomatic. The important point is to know when an aspiration of the pericardial sac is imperative. From what has already been said regarding the pressure condition in the pericardial sac the therapeutic problem may be thus stated.

Under any and all conditions aspiration is imperative when the intra-pericardial pressure reaches such a height as to seriously interfere with the flow of blood from the venae cavae into the right auricle. This theoretically and experimentally well grounded postulate is, however, somewhat difficult to translate into ordinary clinical terms. It is obvious that we have no practical method of getting at the venous pressure in the cavae and the determination of the venous pressure in the peripheral veins is not a matter of general clinical practice. We are therefore, thrown back upon the determination of the arterial pressure together with the close observation of the condition of the patient's circulation. Having made the diagnosis of an effusion the most important point is to watch the blood pressure carefully at least twice daily. If it shows a steady decline the question of aspiration should be seriously considered. In our experience a *sudden decline* of eight to ten in the blood pressure indicates the necessity of immediate aspiration of the sac, since a sudden drop generally means that the intra-pericardial pressure has attained an immediately dangerous height.

Considering the frequency with which the pleura is tapped, it seems strange that there

should be such great degree of hesitancy on the part of most physicians to aspirate the pericardium, and we would only say from our personal experience that when you are in doubt the risk of a pericardial puncture is vastly less than the risk of sudden death.

TECHNIQUE OF PUNCTURE

This is not in any way different from the ordinary technique of pleural puncture except that one needs to be rather cautious not to do damage to the heart. A great deal has been written about the proper site for puncture. Our own opinion is that the very worst possible place is to puncture near the left edge of the sternum since, as experimental and clinical observations show, this is the place at which the layer of fluid is thinnest and in which there is most danger of wounding the heart. Since, as we have already shown, the fluid accumulates earliest and most plentifully in the Costo-diaphragmatic angle and around the apex, it is in our opinion, clearly indicated to perform the puncture in this region. Marfan in France has advocated putting a needle in just between the rib margin and the ensiform cartilage and turning it upwards until it strikes the pericardium. This is the method which we used in our experimental injections. However, it is distinctly simpler to make the puncture just outside the apex, close to the outer limit of the cardiac dullness. A needle inserted here and directed upward, inward and backwards pointing the needle as it were in the general direction of the hilum of the lung will almost invariably strike fluid if there is any there. Two objections may be raised to this method.

(1) That one goes in all probability through the pleura and the answer to this is that it is a matter of no consequence and that it is highly probable, under these circumstances, that the two layers of the pleura in this locality will be adherent.

(2) The second objection, that of a possibility of wounding a lappet of the lung is we think, groundless, since the lung is pushed back by the exudate in the pericardial sac. We have punctured many effusions at this point without any untoward incident. One need hardly say that aspiration should be done slowly and that it is not imperative to remove all the fluid in the sac, even if this were possible. In most instances the removal of half will furnish such a degree of relief as to make it well worth while. There is, however, much less danger in removing as much fluid as can be obtained from the pericardium, than there is in removing a large pleural

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Coronary Artery Disease*

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GENERAL CONSIDERATIONS

ALL statistical analyses in recent years have shown that cardio-vascular disease has increased in frequency as a cause of morbidity and mortality during the past decade. It now outranks all other diseases as a cause of death. In this regard the degenerative form of heart disease, in contrast to the infectious or valvular form, has become particularly prominent. There is still some doubt whether the increased frequency of coronary artery disease is merely due to more accurate diagnosis and to the fact that more people reach the age of 40, when the degenerative processes begin to take their toll, or whether there is an absolute increase in this disease apart from the above factors. It is my opinion, which is shared by many, that the increase is real and absolute and that after the age of 40, males in this country especially, are more apt to develop disease of the coronary arteries than they were a generation ago. The forces at work producing this change are very obscure and not definitely known but some that need consideration are the *tension* of modern existence, with its constant noises, telephones, automobile fumes, hurry, etc., the great increase in the use of *tobacco*, some peculiarity in our *diet*, and finally a *biological selection*. This latter factor cannot be lightly dismissed, for the very same individuals who succumb to coronary artery disease in the second half of life are apt to be those who were attractive, strong, energetic, both mentally and physically, and able to succeed in early life in competition with their fellow men or women. They would, therefore, be more apt to marry and have children to perpetuate their biological tendencies, including a vulnerable vascular system. Whatever the explanation, the problem that confronts the physician is a great one.

ANGINA PECTORIS

From a practical point of view a consideration of coronary artery disease concerns the subject of angina pectoris, coronary thrombosis, and that form of myocardial insufficiency due to coronary artery sclerosis. This will not be the occasion for a discussion of the theories behind various phenomena, nor of the detailed and rarer aspects

of the disease. At the outset it must be clear that angina pectoris is a definite clinical entity; can be recognized clearly in the great majority of instances and that its future progress and its ultimate pathological anatomy can in a large measure be predicted. It also must be understood that a patient has angina pectoris or he has not and that it is futile to use terms like false angina, pseudo-angina, anginoid or mild angina. To be sure, at times it is difficult or impossible to be certain whether the diagnosis is angina pectoris. But as far as the patient is concerned, it is or is not present. The term mild is often misleading, for the complaint may be mild and the disease may be fatal in a short time. Furthermore, not all chest pains are due to angina pectoris, nor are all sore throats due to diphtheria. We expect certain clinical response from antitoxin if given to a patient when the sore throat is due to diphtheria, and from salvarsan in the case of a luetic sore throat. Likewise we generally expect temporary relief of anginal pain from nitrites and not from digitalis. In other words, there is a special group of patients who have a peculiar chest complaint that can be separated from all others with chest symptoms, who are suffering from angina pectoris.

This peculiar chest complaint which is the most important and often the only feature of the disease, is a sensation of tightness, constriction, clutching, pressure, fullness, warmth, or pain generally starting in the sternum, not usually in the apex region, frequently radiating to the left arm, less commonly to the right, or to the neck, back, or jaw, and coming most characteristically on walking outdoors. It may require walking up a slight grade or hurrying, or walking in cold air against a wind, or directly after meals, to produce this sensation. Although these are the usual precipitating causes, it can come at rest, on excitement, in sleep, or as a result of certain ordinary acts like undressing, shaving, bathing, etc. When the distress comes, it is apt to make the sufferer stop and in a few minutes it is gone. Although other changes may take place during the attack, they are unimportant. Examination during the spell itself need reveal very little except the immobility and apprehensive appearance of the patient. The heart rate and heart sounds

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do not change significantly. There is, however, almost invariably a temporary elevation in blood pressure during the attack. Some show slight transient changes in the electrocardiograms. It is obvious therefore, that the history is all important, for physical examination is frequently entirely negative. For this reason the physician must elicit the symptoms with accuracy and patience, preferably writing down the description of the character of the distress in the very words used by the patient.

What are the factors predisposing to this disease? Of first importance is heredity. There are families that show early degenerative changes in the cardio-vascular system, just as there are neurotic or asthmatic families. With this family tendency there is a constitutional type of person more prone to angina pectoris—the patient who has been healthy and strong, well set, slightly over-weight, with round rather than flat forearms. Although the previous blood pressure may vary from low to very high figures, the average pressure in angina pectoris is slightly elevated. All diseases that are conducive to or associated with arterial disease are factors that predispose to angina. Of first importance amongst them is diabetes. Others are gout, syphilis, chronic lead poisoning, Buerger's disease, and polycythemia. Syphilis is an uncommon cause of angina pectoris and it must be borne in mind that even when the Wassermann reaction is positive, the angina may be due to the same causes as in the non-luetic.

The only valvular disease that may of itself influence the development of angina pectoris is aortic insufficiency—whether it be luetic or rheumatic. At present the prevailing explanation of the attack of anginal pain is that a temporary relative anoxaemia of the heart occurs. The coronary arteries are nourished during diastole, for in systole the orifices are constricted and in aortic insufficiency the diastolic pressure is quite low. It is therefore not surprising that anginal attacks can occur under these circumstances. This explains the group of young individuals in the second and third decades of life who have angina and aortic insufficiency. The expectation as to life is somewhat different in this group as compared to the ordinary case of angina, for in the former the coronary arteries can be perfectly normal and the prognosis may be favorable for a great many years, although unexpected and sudden death occurs in both groups.

There are other conditions which indirectly may produce angina pectoris, by causing a relative anoxaemia of the heart muscle. Marked anaemia especially primary anaemia may be responsible

for attacks that disappear as the anaemia is cured. Hyperthyroidism by exacting a greater demand on the work of the heart may also bring about attacks which disappear as the basal metabolism is brought to normal. It is quite likely that when anaemia and hyperthyroidism produce anginal attacks, the coronary arteries are already somewhat diseased and that the angina is merely brought to light by the additional factors, and remains latent after they are cured.

Finally paroxysms of rapid heart action, such as tachycardia, flutter, and fibrillation occasionally are accompanied by pain that is of the same character as that which occurs in angina pectoris. This may occur even in an individual who has a perfectly normal heart. The marked diminution in the pulse pressure that often accompanies attack of rapid heart action probably is responsible for the anginal pain in these cases. One may infer that even with normal coronary arteries, relative anoxaemia could result, if the heart rate reached 200 or over, and the pulse pressure were about 10 mm. I have seen such a patient who has remained perfectly well for eighteen years after an attack in which he had anginal pain. The heart rate was 250 and the pulse pressure was 8 mm. Hg. The pain may last long enough even to be confused with coronary thrombosis, especially as these patients often have fever and leucocytosis with the rapid heart action. Here also the prognosis would be different than in ordinary cases of angina, because the mechanism involved is not serious.

Apart from the several factors just mentioned, I believe it is best to regard all other patients suffering from angina pectoris as having disease of the coronary arteries. In other words, if anaemia, hyperthyroidism, aortic insufficiency and paroxysmal rapid heart action can be ruled out as contributing factors cases of angina have coronary artery sclerosis. In fact I have never failed to find disease of the coronary arteries in any such case that has come to post-mortem examination. Most of these cases showed thrombosis of the coronary arteries although in a few the arteries were quite patent and merely showed atheroma and distinct narrowing of the lumen.

CORONARY THROMBOSIS

Although angina pectoris and coronary thrombosis are very closely associated they need to be distinguished. Sometimes during the course of angina pectoris an attack of coronary thrombosis is likely to occur. A few patients with angina pectoris die in an attack but without coronary thrombosis, and in a considerable num-

ber the first attack of coronary thrombosis is not preceded by anginal symptoms. Furthermore, anginal symptoms may disappear or appear for the first time after an acute coronary thrombosis. The relation between the two conditions can be compared to the events that occur in the sclerotic arteries of the leg, producing intermittent claudication and eventually gangrene.

An attack of coronary thrombosis differs in many respects from one of angina. It often occurs at rest, the pain is violent, lasts for many hours, and may be located in the epigastrium. With it there is all the evidence of shock—pallor, sweating, collapse, ashen color to the skin, and a feeble pulse. The blood pressure falls and the pulse rises. In 12-48 hours a fever and leucocytosis develops and a pericardial friction rub may be heard. There are evidences of infarction of the heart muscle. Almost any irregularity of the heart may develop and a gallop rhythm is often heard. Frequently there is dyspnea or orthopnea, with rales at the bases of the lungs and Cheyne-Stokes breathing, and even acute pulmonary edema may develop. Occasionally there is slight jaundice and hepatic engorgement and spasm and tenderness in the epigastrium. Many attacks are accompanied by vomiting.

Although the typical case will show several or many of the above features, none of them is invariable and even the pain may be entirely absent. In doubtful cases electrocardiographic changes in the ventricular complexes which are very common during the early days following an attack of coronary thrombosis, may be of great diagnostic value. It is necessary to be familiar with all these evidences of acute coronary thrombosis, as in the milder or atypical instances the diagnosis may depend on detecting any one of them, such as a slight fever after what might otherwise be called an attack of angina.

Several days after the onset, peripheral emboli frequently occur. They result from the dislodgment of bits of the mural thrombus that forms within the cavities of the ventricles adjacent to the area of the myocardial infarction. These infarctions involve the left ventricle more commonly than the right and therefore pulmonary emboli are less common than these reaching the greater circulation and involving the brain, limbs, kidney, and spleen. A further complication that is quite common during these early days is a sudden and fatal rupture of that part of the ventricle that was infarcted.

The clinical course of coronary thrombosis is extremely variable. In some the initial pain lasts several hours and practically nothing more takes

place. The patient quickly starts feeling well and merely spends an asymptomatic convalescence in bed waiting for healing to occur. In others many of the above complications develop. Weakness is a common complaint even when the attack seemed to have been very mild. With recovery anginal pain may appear for the first time or it may disappear. In a few, an aneurysm of the ventricle may result. In a considerable number the attack of coronary thrombosis may initiate a progressive myocardial weakness with symptoms of congestive heart failure.

MYOCARDIAL INSUFFICIENCY FROM CORONARY ARTERY DISEASE

There is a condition included in current terminology which is called arterio-sclerotic heart disease. The term is rather vague and in some respects a misnomer. I doubt whether peripheral arterio-sclerosis produces any appreciable ill effects on the heart, apart from that which results from hypertension when present. If those cases are omitted who have or who show evidence of a previous hypertension, the arterio-sclerosis can only be of importance if it involves the coronary arteries. The term arterio-sclerotic heart disease therefore should be given up, for such cases can more properly be classified as having heart failure from hypertension or coronary artery disease.

There are many patients who have heart failure of the congestive type, without anginal symptoms, who on careful questioning will be found to have had a previous history of angina pectoris or coronary thrombosis. These symptoms may have been so mild or may have occurred so long before the development of dyspnea and congestion that they are overlooked, both by the patient and the physician. Such cases generally show a regular heart rhythm, although occasionally auricular fibrillation is present. A gallop rhythm and pulsus alternans is often found. The electrocardiogram frequently shows significant abnormalities such as curves of low voltage, spread of the Q-R-S waves, abnormal inversion of the T waves, or conduction defects of the junctional tissue or of either of the branches of the bundle of His. Although very few of these findings are absolutely distinctive of coronary artery disease, a summation of all the facts available, especially the past history, enables the physician to make a fairly accurate diagnosis of the anatomical condition of the heart and predict that in a particular case the coronary arteries will be found to be pathological, sclerosed, narrowed or occluded.

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The Significance of Cardiac Pain*

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A PRECORDIAL or substernal pain in one form or other is a common cardiac complaint. The significance of this symptom varies to a remarkable extent. It may indicate a serious organic disease of the heart or, on the other hand, merely represent one of the manifestations of a hypersensitive nervous system. The proper evaluation of this symptom therefore depends not only on a detailed history and a careful physical survey with particular reference to the cardiovascular system, but a keen appreciation of the possibility of psychic and other extracardiac factors.

Angina Pectoris—The pain of angina pectoris and coronary occlusion is the most distinctive of all cardiac symptoms and alone may permit a diagnosis. These two conditions are generally associated with the same basic pathology and are also intimately related from a clinical standpoint. Angina pectoris is not infrequently precipitated and often complicated by a coronary occlusion. It is not improbable that the occlusion of a coronary vessel, possibly in some the nipping of small twigs, plays a very important role in the development of angina pectoris. Despite the various attempts to distinguish between the character of the pain in coronary occlusion and that of angina pectoris it seems quite probable that the fundamental mechanism of the distress is the same in the two conditions. It is coming to be fairly generally believed that an involvement of the coronary arteries either at their point of origin or during their subsequent course is primarily responsible for the vast majority of all cases of angina pectoris. This results in a diminished blood supply and consequently in a reduced efficiency of certain sections of the myocardium. During periods in which the work of the heart is increased it is possible for one or more areas of the myocardium to be overtaxed by a load that is well within the functional capacity of the remaining cardiac musculature. On the basis of this conception, angina and cardiac infarction differ only in the extent to which the functional capacity of a section of the myocardium is reduced.

There is a striking variation in the location dis-

tributed and character of the pain in angina pectoris. The distress is invariably precipitated by anything which increases the work of the heart, more particularly exercise and excitement. It is generally first felt somewhere under the sternum, usually over the upper or lower region and frequently involves the precordium. The pain may later extend to the left shoulder and down the left arm, or in the more severe form possibly be felt in both arms. Again it may be transmitted to the neck, head or straight through to the back. In certain instances the pain or paresthesia first appears at a peripheral point as in the wrist, arm, neck or head, and later be felt in the chest. Occasionally the distress seems to begin in the epigastrium and passes upward to the chest or possibly be entirely confined to the upper abdomen. In the early stages of the disorder there is often no more than a feeling of fullness, heaviness or perhaps a burning sensation in the substernal region. It is frequently first noticed while climbing a hill or going up stairs or during excitement, particularly following a full meal and promptly disappears after the exercise is discontinued or the excitement subsides. With a progression of the condition the distress is more easily precipitated, of a more severe character and takes on a wider distribution.

Angina pectoris is occasionally encountered before 40 and common after 50 years of age. It is one of the most characteristic manifestations of coronary artery disease. While some recover and others live for years, the future is always in doubt. There is always a possibility that syphilis may be a factor, particularly in those in whom the angina occurs at an early age. The location, character and distribution of the pain and the relation to factors which increase the work of the heart establishes the diagnosis. A distress which at some time is not definitely influenced by an increase in the cardiac load is rarely if ever on the basis of an angina pectoris. There may or may not be demonstrable structural changes in the heart. Usually, however, the findings in the heart and arteries are distinctly abnormal or significant alterations occur in the electrocardiogram. It is always well to bear in mind the possibility of an angina pectoris in every individual of the arterio-

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sclerotic age with a vague substernal pain. Even though the distress may seem very indefinite, it is often best to withhold final judgment, especially in those who have enjoyed good health in the past and in whom a psychic factor and other extracardiac causes can be excluded. This is well illustrated by the following patient: A man 60 years old who had always enjoyed excellent health noticed a peculiar discomfort over the upper substernal region. This discomfort occurred at irregular intervals without any apparent cause. Even after a very careful inquiry with reference to the possible influence of exercise and other factors which might increase the work of the heart nothing definite was established. The cardiovascular findings were regarded as being well within normal range for a man of his years. A few weeks later the patient returned and the story then was unmistakably that of an anginal syndrome. When the distress is confined to the epigastrium and the lower chest and particularly when associated with gas, the condition is frequently mistaken for a gastric disorder or gall bladder disease. Occasionally the manifestations, especially during the early stages, may appear to be entirely gastric in origin. The implication of the heart, however, is usually evident if the possibility of coronary artery disease is considered.

Coronary occlusion has frequently been mistaken for severe forms of angina pectoris. The general character and distribution of the pain may be identical. Following the occlusion of one of the main branches of the coronary arteries, however, the pain is usually more lasting and may persist for hours or even days. In many of these the accompanying shock and fall in blood pressure, the symptoms and signs of acute cardiac damage and the later development of fever and leukocytosis readily identifies the condition. Significant alterations usually occur in the electrocardiogram, which in the doubtful case may establish the diagnosis. The pain from the occlusion of a smaller vessel may be indistinguishable from that of angina pectoris. If, however, the individual has never experienced anginal pain before, and particularly if it occurred while at rest or if in those with angina the distress is more severe than usual and in addition appears under unusual circumstances, we are justified in suspecting a coronary occlusion. The diagnosis is entirely dependent on the demonstration of acute structural changes in the heart. This is occasionally evident through the development of a gallop rhythm, the appearance of a systolic apical murmur or the occurrence of an alteration in the electrocardio-

gram. The latter may be the only means of detecting the cardiac damage.

In certain instances a precordial or upper chest pain from an intercostal neuralgia or the nerve root pressure from a mediastinal tumor, tuberculosis or arthritis of the spine may arouse the suspicion or closely resemble that of angina pectoris. This recalls a patient 40 years of age with precordial pain that had been diagnosed angina pectoris. After a careful analysis of the pain the explanation was not clear and the possibility of angina was by no means excluded. The patient was retained for further observation with particular reference to the influence of exercise. In the meantime a search was made for extracardiac factors and finally an early tuberculosis of the spine discovered. While under treatment for the spine condition the precordial distress entirely disappeared. The writer has seen several instances of arthritis of the spine in which the occurrence of distress over the upper chest had aroused the suspicion of angina. It is worthy of note that the majority of these patients were physicians.

Finally, pain simulating that of angina is occasionally seen in individuals in whom a hypersensitive nervous system is the basic factor. While the pain may resemble that of the anginal syndrome, particularly from the standpoint of the distribution, a careful analysis will show that it fails to comply with the requirements of the former in that it is not precipitated by any one factor and occurs at any time. These individuals have usually experienced various forms of emotional upsets and it is often possible to get a history of some relative or friend having had angina pectoris. Moreover the findings of the cardiovascular system are entirely negative.

Coronary Occlusion—Pain is often the outstanding and frequently the most characteristic symptom of coronary occlusion. The onset is usually abrupt often while at rest or in many instances during sleep. Occasionally the onset is gradual, extending over a period of several hours or even two or three days before reaching the severe form. The distress varies in intensity from a feeling of fullness or heaviness to that of the most intense and agonizing pain. In the more severe form it lasts from a few hours to days and may persist in a minor form even after repeated hypodermic administrations of morphine. The location is similar to that of angina pectoris except perhaps for a greater tendency to involve the lower sternum and the upper abdomen. In rare instances as in angina the pain may be entirely confined to the upper abdomen. The dis-

tribution is likely to be greater than that of angina in that it frequently extends to both arms and usually involves a greater area of the chest. The pain may likewise be felt in the neck at various locations about the head or even transmitted to the posterior chest. The more severe distress is usually associated with the occlusion of a large vessel. There are instances, however, judging from necropsy findings, in which a large infarction was not apparently manifested by significant symptoms. The pain, if present, was presumably of a rather mild nature, or in cases with angina pectoris perhaps no more than that experienced during an ordinary attack.

Pain, particularly of the severe type is invariably associated with other symptoms. The onset is generally accompanied by profound shock in which the ashen gray color, profuse perspiration, the feeble pulse and the fall in blood pressure are conspicuous features. The normal color often returns and the perspiration disappears after the severe pain subsides, but the exhaustion and feeble pulse may continue for days depending on the extent of the myocardial damage. There is generally a sharp reduction in the blood pressure and the systolic phase may recede to 90 or even lower. The pain is usually accompanied by varying degrees of dyspnea. In some, the onset is with intense dyspnea and if pain is present it is entirely overshadowed by the former.

There is a great variation in the physical findings. In some, even after a severe attack of pain the structural alterations in the heart are so slight that they may be readily overlooked. There may be no demonstrable increase in the size of the heart. The cardiac rate is usually accelerated, but seldom above 100 to 110 per minute, except in those with extensive damage of the myocardium. Premature contraction not infrequently occurs. A systolic apical murmur may be heard or appear later. It is often faint in the beginning but later may become more conspicuous. The distant and poorly differentiated cardiac tones and a gallop rhythm are perhaps the most constant physical signs and may be the only demonstrable change in the physical findings. In those with a more profound disturbance in the cardiac function the alterations in the heart are at once evident with perhaps the additional manifestations of pulmonary edema and engorgement of the liver. A pericardial friction rub is occasionally heard on the second or third day, and is the most distinctive physical sign of cardiac infarction.

A significant cardiac infarction is usually ac-

companied by fever and a leukocytosis. Fever ranging from 99 to 102 usually appears on the following day, reaching the highest peak on the third to fifth day and occasionally may last a week or longer. This is accompanied by a leukocytosis of 12,000 to 20,000. These findings may aid in the diagnosis and are of importance in estimating the extent of the cardiac damage. A brisk and particularly a prolonged reaction is usually indicative of extensive degeneration of the myocardium.

The electrocardiographic findings are frequently characteristic, and in doubtful cases may establish the diagnosis. The alterations concern for the most part the T deflection and the Rt and St segments. The change from day to day is the most distinctive feature and unless curves are taken as soon as possible after the accident, and at one or two day intervals for the first week or ten days electrocardiographic manifestations may be overlooked. Soon after the cardiac infarction the T wave and often the entire Rt segment may be elevated in Lead I and suppressed in Lead III, or the reverse order is observed. This is followed by a gradual change to the opposite direction in which the T becomes negative in Lead I and upright in Lead III, or *visa versa*. The negative T or segment deviation are not infrequently accompanied by the development of a Q complex. There may, in addition, be a significant reduction in the amplitude and occasionally an increase in the duration of the QRS group. Premature contractions of the ventricular type are rather common, and in rare instances a ventricular tachycardia is observed.

The diagnosis is usually evident in the typical case from the history and physical findings. When, however, the pain involves the epigastrium and particularly when confined to this region, especially if accompanied by tenderness, rigidity, nausea and vomiting, the condition may closely resemble a perforating peptic ulcer, gall bladder colic or even acute pancreatitis. Under these circumstances the past history may have a decided bearing on the diagnosis. It may bring out a recurring indigestion of peptic ulcer, possibly implicate the gall bladder or indicate a previous angina pectoris. In doubtful cases the diagnosis is dependent on the demonstration of acute myocardial damage, which is usually possible through a careful survey of the heart. Occasionally, as previously pointed out, the alterations in the electrocardiogram may be the most distinctive evidence of a cardiac lesion.

The foregoing remarks pertain chiefly to the occlusion of one of the main branches of the coronary arteries. Occasionally, as indicated under the discussion of angina pectoris, the closure of a small branch may be identified if the possibility is borne in mind.

The course following coronary occlusion is extremely variable. Some die instantly, whereas others may live for years even after the occlusion of one of the main branches of the coronary arteries. Between these extremes there are all grades of cardiac disability. Even though the patient may survive the infarction and retain an efficient cardiac function, experience has taught us that recurrences are common. Moreover, for some time following the occlusion there is always the possibility of emboli being dislodged from the mural thrombus formed at the site of the emboli. In most instances the sclerosis of the coronary arteries is fairly advanced before an occlusion occurs and the latter merely represents one of the manifestations of the end stage of the disease.

Other Types of Cardiac Distress—They vary in character from a dull fleeting or a more or less continuous ache to that of a sharp stabbing pain. Precordial distress is common in acute rheumatic heart disease, and is occasionally observed in chronic valvular heart disease, especially mitral stenosis and aortic insufficiency. It is often present at some time during the course of acute rheumatic heart disease, and the frequency of the occurrence appears to be roughly proportional to the intensity of the rheumatic infection. In occasional instances the character and distribution of the pain resembles that of the anginal type. With pericarditis the pain is not infrequently sharp or even stabbing in character. It is usually confined to the precordium but may radiate to the neck or left shoulder and arm as in angina. In rare instances, because of the involvement of the diaphragm, the pain is referred to the abdomen. In view of the involvement of the coronary arteries and possibly the invasion of the aorta and pericardium, it is not surprising that children with rheumatic heart disease have precordial discomfort and even anginal pain. The distress associated with a mitral stenosis and aortic insufficiency in rare instances may likewise be anginal

in character. The explanation here is perhaps the same as in acute rheumatic heart disease. Some have assumed that the pain associated with a mitral stenosis may in certain instances be attributed to the dilatation of the left auricle.

A certain amount of precordial discomfort is frequently seen with premature contraction, paroxysmal tachycardia, auricular fibrillation, auricular flutter, high grade anemia, thyrotoxicosis and occasionally with a simple tachycardia of a functional origin. The distress, under these circumstances is often associated with a palpitation, and in certain instances a hypersensitive state of the nervous system is an important factor. The latter is particularly conspicuous with the irritable heart in which the precordial discomfort is often an outstanding symptom. Other factors as abdominal flatulence, fatigue, loss of sleep and the excessive use of coffee, tobacco and alcohol may induce or aggravate the symptoms. Occasionally a precordial discomfort, along with palpitation is one of the early complaints in pulmonary tuberculosis, not infrequently observed during the convalescence from severe infection and may be a very troublesome feature during menopause. It is apparent that various factors may contribute to the production of cardiac discomfort and that the appreciation of its significance may demand a very comprehensive survey.

PERICARDITIS WITH EFFUSION

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exudate, since after all the quantity of fluid in the pericardium usually is much less than a pleural exudate would be. One of the very interesting things to note is the immediate disappearance of a large area of dullness in the left scapular region after a paracentesis of the pericardium.

The final thought we would like to leave with the physician is that while the diagnosis of pericarditis with effusion is frequently missed this is more because of not thinking about it than from a lack of skill in physical diagnosis. If the points enumerated be borne in mind the percentage of cases overlooked should be very small.

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The Mechanism and Significance of Heart Murmurs*

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A BETTER understanding of the mode of production of heart murmurs brought about within the last decade allows a more accurate understanding, both of the conditions in which they are produced, and of their significance to the patient. The theory of Weber, held for more than a generation, to the practical exclusion of other concepts of murmur production, is entirely inadequate to explain many of the facts about the site of maximum intensity, of area of distribution and of transmission of many murmurs. Weber's theory limits the production of murmurs to the valve and the walls of their orifices and to the walls at the point of entrance of a narrow into a wider tube, or area.

That murmurs could be produced within the chambers by a jet or stream of blood entering a resting, slower, or opposite-moving mass of blood by the whirl or eddies; i. e., by turbulence in the fluid, had been suggested as early as 1842 by Skoda, who looked upon this as a theoretical possibility, in addition to the view of his time, which was that the moving column of blood rubbed against the walls of the heart or vessels, and, especially if they were roughened, set them in vibration. Corrigan and a number of others adhered to this as a possibility, although the physical and mathematical basis was not understood. Experimental proof that the turbulence could cause murmurs has been lacking or so little known that the idea has been quite generally rejected until very recently.

Bondi¹, in Wenckebach's Clinic in Vienna, beginning with 1927, has published the results of experimental work carrying our knowledge of the origin of murmurs much farther than it has ever been carried before. Summarized, this work shows that murmurs in the heart and vessels are produced almost to the exclusion of other mechanisms, by turbulence in the streaming blood. The whirls and eddies of a turbulent stream were shown to produce sounds with all the characteristics of the many forms of heart murmurs. It is important to recognize the demonstrated fact that these murmurs are not transmitted any considerable distance by fluids or by the walls of the chambers or vessels. The vibrations are promptly damped by the fluid and by the walls.

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When a jet of fluid is made to transverse a chamber and strike its opposite wall, a murmur can be heard only at or very near the area of impact. When such a jet is made to flow along the wall of a chamber, the sounds produced by the streaming, turbulent fluid can be heard over the course of the jet and disappear when either distance or velocity of flow allows the amplitude of the vibration to sink below the level of audibility. If a stream of fluid enters a chamber at high velocity and through a narrow orifice; i. e., $\frac{1}{2}$ to 1 mm. in diameter, a high-pitched, musical murmur can be heard a very short distance, $\frac{1}{4}$ to $\frac{1}{2}$ mm. from the point of entrance of the jet. A little farther away there is the admixture of lower tones, and still farther the murmur becomes low-toned and rough. The demonstration that turbulence in the fluid can produce murmurs with all the characteristics of those heard over the heart, helps us to understand and clarify many clinical observations heretofore obscure. Only a few brief illustrations can be given here, the reader interested in further details being referred to Bondi's work, or to reprints of the author's paper in the 1931 Proceedings of the Inter-State Post-Graduate Medical Assembly.

In lesions of the aortic valve, both stenosis and insufficiency, there may be formed during systole a broad jet with strong turbulence which extends well up the aorta and even into its branches, most commonly the right carotid. The peripheral mantle or sleeve of fluid, which would ordinarily damp these vibrations, is a narrow one and a rough systolic murmur is audible and may be heard well up into the carotids and subclavians. Particularly in stenosis the direction of the jet may not be parallel to the axis of the aorta, but it may strike the wall at some point and follow along it, giving a streaming murmur heard well up into the branches.

The protodiastolic murmurs of aortic insufficiency are of historical, as well as practical, interest. Corrigan, in 1832, sensed the probability that in this condition turbulence of the regurgitant stream was responsible for the murmur, but his idea did not receive acceptance, for in his time the experimental proof was lacking.

In insufficiency of the rheumatic aortic valve the orifice may not be large and is likely to be

near the center of the valve group. Thus, a narrow regurgitant stream may be formed and give an impact murmur at the point where it comes in contact with the wall of the ventricle. This is most likely to be near the base of the ventricle and to have the narrow localization, often with high pitch and sometimes with musical quality, frequently associated with this particular lesion.

The explanation for the murmur of mitral stenosis lies also in turbulence of the stream projected into the mass of blood in the ventricle through the narrowed orifice in diastole. When, as in pure mitral stenosis, the volume of blood is small there is a narrow mantle or sleeve to damp the vibrations and the wall of the ventricle near the apex is reached before there is much lessening of the turbulence. Thus, the impact of the stream causes the localized and peculiar murmur and thrill to be perceptible.

Eimer² and Dressler³ report the typical murmur of mitral stenosis in a case of myxoma of the left auricle, the valve leaflets normal, and in a case of a thrombus filling the left auricle, respectively. In both of these cases the explanation for the murmur lies not in the production at a diseased valve orifice but in turbulence in the stream.

When mitral stenosis is combined with insufficiency so that the left ventricle is dilated this larger mass of fluid provides a damping mantle such that audible vibration may not reach the surface of the heart and we are thus able to understand the absence of the diastolic murmur in these cases even in the presence of a definite stenosis. Conversely, when we note narrow localization of a diastolic and auriculo-systolic murmur of mitral stenosis, and particularly when this is of high pitch, we can have greater confidence in our opinion that it is a manifestation of a narrow slit in the mitral orifice, i. e., of a relatively high grade stenosis.

In mitral insufficiency there is a rare but important type of murmur heard in the region of the seventh and eighth dorsal vertebrae, produced by the impact of a turbulent stream from the mitral orifice striking the dorsal wall of the dilated auricle as it presses against the structures in the posterior mediastinum and the bodies of the vertebrae at the level above described. The typical apical murmur of mitral insufficiency is usually heard in the same case, but in several instances I have heard this murmur alone. It should, therefore, be sought for whenever mitral insufficiency is suspected.

The usual systolic murmur of mitral insufficiency, heard over the entire area of the left ventricle, and with maximum intensity at the apex,

is produced by turbulence of the flow among the fleshy columns lining the ventricular wall which provides obstacles about which many whirls occur. These whirls are very near the heart wall, are thus readily heard, and because of their nearness to the wall and the amplitude of vibration this type of murmur is readily transmitted along the ribs, sometimes a short distance only, but often as far as the axilla or even the angle of the left scapula. The fact that the systolic murmur of mitral insufficiency is heard over the entire area of the left ventricle available to auscultation in many instances now becomes readily understandable. It is no longer necessary to explain it as produced at the mitral valve and transmitted by means contrary to experience to the point of greatest intensity; i.e., the apex. When it is understood that the systolic murmur of mitral insufficiency is produced not at the mitral orifice nor by the valve leaflets, but is produced by turbulence at innumerable sites along the roughened inner ventricular wall it becomes easy to understand why the physical qualities of the murmur do not allow distinction between the murmur of insufficiency due to a shrunken valve and that due to dilatation of the valve ring. The distinction between an organic lesion and a relative insufficiency at the mitral orifice must be made on evidence other than the character of the murmur.

The subject of musical murmurs would require exposition too long for this article. Let it suffice to say here that it is possible to produce such murmurs by turbulence in the stream and it is no longer necessary to ascribe a musical murmur to an aberrant or stretched tendon fibre in the heart chamber. To find at autopsy such a fibre as an adequate cause of a musical murmur is a rarity.

The "unimportant" murmur has interested the writer for many years. The term explains itself. It is not a diagnosis but is an expression of opinion. As such it should be used with proper precaution and the opinion should be expressed only after a proper foundation has been laid therefor. The term is used to cover the presence of a murmur in an individual with a heart perfectly healthy in every respect. Such qualifying terms as physiological, functional, accidental and haemic are frequently used to designate this murmur, unimportant as it is so far as indicating disease of the heart itself or of the great vessels adjoining. Each of these terms has objections to its use and certain of the terms such as "haemic" murmur would appear to have a very limited application, although it has been used by some as synonymous with physiological. Of all these terms "unimportant" is the least confusing. It

is used here to designate the systolic murmur heard over the region of the pulmonic valve and is systolic in time. It may be transitory with some individuals and relatively permanent with others. In the presence of fever, after exercise, or with the viscosity of blood reduced as in anemia, the rate of blood flow may rise readily to that critical velocity at which turbulence with audibility develops in fluids flowing through a tube even with smooth walls. The region of the conus pulmonalis, the pulmonary valve and the pulmonary artery is a region with thin walls and low intracardiac and intravascular pressure. Such a region would be more readily affected by pressure from without than is the case in any other region of the heart. Pressure of the ventral surface against the chest wall or pressure of the adjacent aorta with its higher pressure and stiffer walls against the wall of the pulmonary artery would readily cause a change of contour and develop turbulence in the stream. The well-known shifting of the mediastinal contents with change of posture might allow such external pressure to be effective in producing the murmur in one position and not in another. The streaming blood lies closer to the surface of the chest wall here than at any other part of the precordia. For this reason a very faint streaming murmur would be audible here when vibrations of the same intensity and periodicity produced in the blood in other regions of the heart might not reach the surface with audibility. Before the beginning of the present century Balfour called this the region of auscultatory romance.

The "unimportant" murmur may occur in individuals with any habitus, but it is much more common in the hyposthenic and asthenic types. It is affected greatly by posture, it may be heard when the individual is recumbent and lessen or disappear on sitting or standing. Rarely the reverse is true. While this murmur is best heard at the pulmonic area and may be limited to it if not very loud, it is often heard at the same time but with lessened intensity farther down over the precordia, especially over the bare area and sometimes well down toward the apex. It is not trans-

mitted upward nor is it heard beyond the limits of the precordia.

Apical systolic murmurs are sometimes heard when there is no demonstrable lesion but the statistics of life insurance companies gives this murmur a definite significance and the writer does not include it among the "unimportant murmurs."

It is probable that lack of full knowledge on the part of the physician is responsible for much of the misunderstanding patients have as to the significance of a murmur. To tell the average patient that he has a murmur is to indicate to him that he has some heart disease. To refrain from telling him about the murmur and its significance is to open oneself to the accusation of incompetence or dishonesty. It is incumbent on the physician in every instance to get sufficient evidence by the necessary means as to the structural and functional conditions in the heart and circulation, and when this has been done the murmur can be relegated to its proper position, which is usually that of only one piece of evidence in a chain. If the murmur is not an evidence of organic disease the individual is entitled to know it. If it is the only remaining evidence of some past process now no longer progressive and of little or no significance so far as the patient's life expectancy or functional capacity is concerned, that likewise should be made clear.

In a physical examination auscultation over the heart should be practiced only after all the facts about the peripheral and pulmonary circulations have been obtained. Thus the temptation to give undue significance to a murmur is more readily avoided. Let us remember, however, that there are occasional circumstances in which the evidence given by a murmur has more weight than that given by any other method of examination, whether it be history, physical conditions, X-ray, silhouette or electrocardiogram.

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Cyanosis and Dyspnea*

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CYANOSIS and dyspnea, the twin portents of evil in all diseases of the circulatory system, can be approached by way of analysis of the events in normal respiration and metabolism in the terms of oxygen and carbon dioxide supply.

The Mechanics of Respiration—The air in the lung alveoli, the source of all oxygen used by the tissues in the life processes, contains 13-14% of oxygen and 5-6% of carbon dioxide, with a tension, or partial pressure of 100 and 40 mm. of mercury, respectively. The oxygen diffuses through the alveolar wall into the blood which has a lower tension and combines with the hemoglobin of the corpuscle. The corpuscle leaves the lungs practically saturated with oxygen, carrying nineteen parts (95%) of oxyhemoglobin to one (5%) of reduced hemoglobin, and is said to have 95 volumes per cent of saturation to 1 volume per cent of unsaturation.

In the capillaries it comes in contact with the cells which are using oxygen constantly in their metabolism, and in a state of depletion offer a field of low oxygen tension into which the oxygen diffuses, and where the corpuscle leaves five parts of the original twenty. It then returns to the veins with an oxygen unsaturation of 6 volumes per cent which is evidenced by the blue color of the reduced hemoglobin. In the capillaries the average unsaturation is only 3.5 volumes per cent. Cyanosis does not develop until at least 5 volumes per cent is reached, and usually 6-7.

By the same oxidative processes that demand a steady and generous supply of oxygen, and in the same degree, carbon dioxide accumulates as a waste product and must be loaded into the blood with its relatively low carbon dioxide tension and sent back in the veins to the lungs, in chemical combination with the plasma and the corpuscles. Here the carbon dioxide tension is lower than in the blood and so the gas is drawn out of its soluble form and through the alveolar wall into the air. The blood comes into equilibrium with the alveolar air and starts a new cycle in the arteries with high oxygen and low carbon dioxide values.

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The maintenance of this balance between respiratory and metabolic supply and demand depends primarily on the respiratory centre (actually multiple but for convenience grouped as if a unit) and its sensitiveness to changes in hydrogen ion concentration in the blood. The ratio of acid to base (carbonic acid to sodium bicarbonate) must remain approximately at one to twenty. Minute deviations from this by an increase of carbonic acid penetrating the nerve cells of the centre stimulate it to decree an increased depth and rate of breathing. This governing mechanism is like the driver of a car in a narrow one-way street. Ordinarily he holds the middle by slight and involuntary adjustments to right and left, thus smoothly and effortlessly maintaining a constant and central course. But obstacles or dangers in the path may lead to larger and more abrupt swings of the wheel and perhaps disaster by swerving too far to either side, comparable to the dangers of acidosis and alkalosis.

Cyanosis—Cyanosis is due to an abnormally large amount of reduced hemoglobin in the capillary blood, and implies an oxygen unsaturation of usually 6-7 volumes per cent, the normal being 3.5 volumes per cent. Cyanosis appears when there is 5 grams of reduced hemoglobin per 100 cc. of blood. The normal blood containing 14 grams of hemoglobin must have about one-third in the reduced form before the blue color is seen. In anemia with less than a third of the normal hemoglobin content there is not enough hemoglobin, even if all were unsaturated with oxygen, to give the blue color. And in polycythemia a normal percentage of unsaturation will give more than the requisite 5 grams of reduced hemoglobin. Aside from these intrinsic blood conditions and a few rare chemical poisons, however, cyanosis can be regarded as evidence of insufficient oxygenation of the blood in the capillaries and usually is associated with oxygen lack in the tissues, and so with some degree of dyspnea.

Insufficient Alveolar Oxygen—If insufficient oxygen is taken into the alveolar capillaries unsaturation of hemoglobin will give cyanosis. If the oxygen tension falls below 100 mm. of

mercury oxygenation is impaired, and at high altitudes adequate saturation of hemoglobin is impossible. In acute and chronic lung diseases, as well as in congestive heart failure, diffuse edema or fibrosis of the alveolar walls prevents the diffusion of adequate alveolar oxygen into the blood. Asphyxia by mechanical interference with air intake, either gradual or rapid, is characterized by cyanosis. Shallow breathing, as in pneumonia, provides insufficient alveolar oxygen. Inadequate exposure of the blood to the alveolar air, by a shunting of the blood from the venous to the arterial side causes cyanosis if a third of the blood has failed to come in contact with the alveolar air. Collapse or consolidation of a large portion of lung, as in lobar pneumonia, permits the blood to circulate but gives no oxygen to it. In congenital heart disease where there is an admixture of venous and arterial blood the same failure of oxygenation occurs. Cyanosis may appear only after exercise, due to the extra demand for oxygen and the resulting increased unsaturation. The carbon dioxide content and hydrogen ion concentration may remain normal in spite of the oxygen deficiency.

The retardation of flow through the capillaries will increase the reduced hemoglobin and tend to bring on cyanosis. In acrocyanosis the slow venous return keeps the corpuscles exposed to the demands of the tissues so long that the oxygen supply is depleted below the usual level. In heart failure with slowing of the circulation several factors may operate, including edema of the pulmonary alveoli, slowing of the circulation through the capillaries, and increased oxygen need in the tissues.

Dyspnea—Dyspnea has been defined as the "consciousness of the necessity for increased respiratory effort" (Meakins, quoted by Wright). Ordinarily the pulmonary ventilation may be doubled without conscious effort, and real distress does not occur until the breathing is increased four to five times the usual. The respiratory centre regulates the depth and rate of respiration, and is governed in turn by the degree of anoxemia, or oxygen lack in the blood. The consideration of dyspnea resolves itself for practical purposes into the analysis of the types of anoxemia. Anoxemia, with corresponding dyspnea, occurs in the normal individual after exercise which uses up the oxygen supply in muscle activity. Increased metabolism in thyroid intoxications brings about dyspnea for the same reason. Disturbances in the acid-base equilibrium, as in nephritis and diabetes,

stimulates the respiratory centre to increased effort. Anoxemia is classified by Barcroft according to its origin, as anoxic, anemic and stagnant.

1. Interference with oxygen intake causes anoxemia as, (a) when the pressure is too low to force the air into the blood in high altitudes, (b) in mechanical obstruction of the air passages, (c) in pulmonary edema, emphysema and other lung conditions where the air cannot diffuse through the alveolar wall, (d) in failure of the respiratory centre from mechanical or chemical causes.

2. Interference with oxygen transport results in anoxemia, (a) when there is lack of available hemoglobin to carry the oxygen, as in anemia where it is insufficient in amount, and in poisoning by carbon monoxide which has a powerful affinity for hemoglobin. Cyanosis and dyspnea do not occur typically. (b) In slowing circulation, as in cardiac failure, where the unduly prolonged contact of the blood with the tissues uses up the oxygen and hinders the approach of a new supply.

3. Inability to utilize oxygen in the tissues on account of protoplasmic poisoning, as from the cyanides.

Circulatory Disease—It should be admitted that there are multiple vasomotor, neurogenic, excretory and metabolic factors entering into the production of dyspnea and cyanosis in cardiac disease other than oxygen lack in the capillaries and oxygen unsaturation in the blood which must be passed over in this brief review. Dyspnea on exercise is the first symptom of a failing heart. An increase in pulmonary ventilation is brought on by the increase in basal metabolism which occurs in early failure. The circulation is slowed up in the tissues due to the ineffectual heart function and so oxygen lack develops. Edema of the lungs interferes with the oxygenation of the blood. The respiratory centre is stimulated by carbon dioxide retention and by oxygen lack. Accumulation of fluid in the thoracic and abdominal cavities, depression of the respiratory centre and kidney insufficiency may exaggerate the symptoms. Cyanosis may appear early or late, depending on the degree of oxygen unsaturation in the capillary field.

Cardiac asthma has been explained by Danzer on the basis of increased blood velocity through the capillary bed. The blood at first may have sufficient oxygen, but goes through the tissues too rapidly to supply them. Mechanical or chemical methods of retaining the corpuscles in

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The Significance of the Electrocardiogram In Cardiac Diagnosis*

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IT CAN be said without fear of contradiction or even question that of all the methods of precision used in the studies of patients with heart disease, electrocardiography has yielded the most important and significant contributions. By virtue of the vigorous application of the method to the study of patients with disturbances of the heart rhythm Einthoven and especially Lewis completely analyzed and classified the clinical disorders of the heart beat and established simple bedside rules for their differentiation. Most of the cardiac arrhythmias can now be diagnosed almost by rule of thumb, but most clinicians who become adept in this art have had some training in an institution where there has been available frequent electrocardiographic confirmation or refutation of conclusions drawn from the physical examination. A frequent check-up of this sort is not only desirable but practically indispensable.

Besides increased proficiency in distinguishing the irregularities of the heart beat, the physician, who can devote a small amount of time to the subject of electrocardiography will be also otherwise rewarded. His most valuable acquisition will be clear conception of the mechanism, origin, genesis and propagation of the excitatory process that inaugurates and accompanies the heart beat. Without such knowledge as makes possible the visualization of the cardiac function and action, few become proficient in modern cardiological practice. The practitioner can gain much from a brief study of the special anatomy and physiology of the heart and the interpretation of the usual mechanism disturbances in such terms. The diagnosis should always be made first by the application of the bedside rules to the differentiation of the disorders in the heart beat presented by the patient and then the electrocardiograms should be taken and the findings compared and final conclusions drawn. Corroboration of this sort is desirable as often as it is possible.

The interpretation of the electrocardiogram especially in the matters of the ordinary arrhythmias is far more simple than is the analysis of a polygram. With a clear conception of the

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elements of the physiology of the cardiac mechanism and the recognition of the P wave as auricular activity, the P-Q or P-R as the auriculoventricular conduction time with an upper limit of 0.20 sec. and the Q-R-S as the ventricular complex and the interventricular conduction time of 0.6 to 0.8 sec. and the T as the end of deactivation period of ventricular activity and the period from the end of T to the next P as representing the isoelectric or diastolic rest period, little difficulty should arise after a bit of practice. Of course a knowledge of the types of arrhythmias that may occur in the human heart is prerequisite. It is comparatively easy to interpret the gross disturbances in the graphic record noting the regularity or irregularity, presence or absence or distortion of the auricular or ventricular complexes or the intervals. The time markings give rise to some confusion but should not if it be remembered that the spaces between the broader lines represent fifths $1/5$ or $20/100$ or .20 sec. while the fine lines divide this into space into five equal intervals of $1/25$ or $4/100$ or 0.4 sec. each.

Although it is true that most of the ordinary disturbances or the cardiac action can be distinguished clinically there are notable exceptions that must be admitted to be extremely difficult if not impossible of interpretation without resorting to graphic and especially to the electrocardiographic method. Auricular flutter for example as well as paroxysmal and sinus tachycardia frequently does not respond to vagus or ocular pressure and must be left to the electrocardiogram for the final decision. The point of origin of paroxysmal tachycardia likewise cannot be determined with any degree of certainty by the clinical criteria alone, but the focus is usually quite evident in the electrocardiogram. Slight disturbances in conduction thru the auriculoventricular bundle or in one of its chief branches may give suggestive signs in the heart sound changes and sometimes visible splitting of the apex beat but these diagnoses are acceptable only when confirmed by electrocardiographic evidence. Often Sino-auricular standstill or heart block of a partial type may be recognized clinically with difficulty, if at all satisfactorily, from very

early premature ventricular contractions, that make little sound at the apex. Even multiple premature contractions sometimes fail to obey the rule of disappearance at the higher rates or the higher heart rate cannot be obtained or resorted to for the differentiation from the classical auricular fibrillation which characteristically becomes more irregular as the rate rises. The chronic slow auricular fibrillation in senile arteriosclerosis may be overlooked or considered to be due to rare ectopics occasionally in the routine physical examination especially when the A-V block is of high grade clinical only but here as in all mechanism disturbances the electrocardiographic findings are diagnostic.

The field of usefulness of the electrocardiographic method is by no means limited to the establishment of the exact interpretation of mechanism disturbances.

The electrocardiogram must be considered only as a part of the clinical study. The electrocardiogram can by no means take the place of the physical examination for it gives little if any information as to the myocardial reserve or tone or strength. The history cannot be superceded but still some etiological facts and prognostic evidences are often suggested in the electrocardiogram. While it is quite true that not infrequently patients with definite physical evidence of heart disease present no definite electrocardiographic changes nevertheless an abnormal electrocardiogram in itself without any pathognomonic physical signs of heart disease must be considered significant evidence of myocardial damage. When the reliable physical criteria are present the electrocardiogram though not needed for the diagnosis of heart disease may add valuable information especially as to the presence or absence of otherwise indeterminable and important myocardial changes of serious prognostic significances. It is just in the borderline cases of possible heart disease that electrocardiographic studies are most desirable.

After the acute infectious diseases particularly those that are known to frequently involve the heart and by all means when a murmur has developed the finding of an abnormal electrocardiogram would materially affect the further management of the case. In, for instance, the case in which the question of a differentiation of acute rheumatic fever or acute infectious arthritis arises, the presence of premature contractions would suggest the former. Any additional changes as an increase in the P-R interval the A-V conduction time, would further presage rheumatic myocardial involvement even in the

absence of any physical signs. Such a finding would materially alter the further management of such a case especially if a murmur were present. In fact, such findings would justify a prolonged period, months of rest in bed. Diphtheria may produce extensive and fatal changes in the conduction system of the ventricle and these may be unsuspected until the post mortem after the sudden death of the patient. In such instances electrocardiograms would have revealed the seriousness of the situation. Symptoms may be entirely absent and therefore it would be the part of wisdom to have an electrocardiographic tracing on every patient that has suffered from a severe infectious disease.

IN CARDIAC VALVULAR DISEASE

The patient with valvulitis can be more completely studied and an after evaluation of the situation established by resorting to electrocardiographic method. The length of time that valvular defect has been present and the extent of the resulting impediment or strain may be suggested by the degree of preponderance. The prognosis is modified to some extent by the presence or absence of electrocardiographic changes. The interpretation of murmurs and the determination of the position of anatomical or valvular changes and thus in turn the etiological diagnosis is often materially influenced by the electrocardiographic predominance or preponderance. In the case, for instance, that presents a high pitched basal diastolic and low rumbling apical diastolic murmur and slight if any peripheral phenomena, the differentiation of syphilitic aortic disease primarily with a functional mitral obstruction producing an Austin Flint murmur, from a high grade organic rheumatic mitral stenosis with a dilatation of the pulmonary ring producing a relative insufficiency and a Graham Steele murmur is made more possible by a consideration of the electrocardiographic predominance. A right ventricular predominance argues for primary rheumatic mitral disease while a left ventricular predominance makes aortic regurgitation more likely as a diagnosis. Aortic stenosis produces a basal thrill and murmur and left ventricular predominance, pulmonary stenosis a great right ventricular predominance.

In the presence of great cardiac enlargement and unusual murmurs and thrills especially in young adults without any history of etiological infectious disease, the presence of high complexes and great right ventricular preponderance is in favor of the diagnosis of a congenital heart disease. Congenital or primary dextrocardia with

situs inversus viscerum totalis gives a pathognomonic electrocardiographic picture with inversion of all waves in lead I, the reverse of the normal and leads two and three are interchanged. Care must be taken to see that arm leads have not been reversed in the taking of the curve, while the heart that is secondarily transposed drawn into the right chest by contracting pleuropericardial adhesions or by pulmonary atelectasis produces a slightly if at all altered electrocardiograms.

IN THE PROGRESS OF LIFE

Under the usual conditions of life the electrocardiogram remains the same for each individual, it changes very little from decade to decade. The appearance of alterations in the form of the waves or complexes is quite significant whether these develop progressively or whether they arise or come suddenly into evidence. In order to insure a control normal it would be necessary to have an electrocardiogram taken as a part of the periodic health examination. At least it would be desirable to do this as the age of 50 years is approached, and before any symptoms appear. Usually, however, the electrocardiogram is not deemed necessary or advisable until an attack of pain or breathlessness has brought the patient to his physician. It is certainly desirable to take electrocardiograms frequently on patients with hypertension for the appearance of myocardial changes may in this way be detected early even before symptoms or signs appear. In the question of the chronicity or the malignancy of the hypertension the electrocardiogram by virtue of the presence of or of the degree of left ventricular predominance. Changes as defective intraventricular conduction may occur under such conditions and pass for extreme preponderance changes. Auriculo-ventricular, bundle branch or intraventricular block occur in chronic malignant hypertensive patients and especially in those with arteriosclerosis and without or with syphilis or chronic rheumatic heart disease.

IN CORONARY ARTERY DISEASE

The electrocardiogram may yield the most significant information in the patient who has suffered from an attack or attacks of thoracic pain that might or might not be of cardiac origin. Curves taken during the attack may show distinct but transient changes in the form of the ventricular complexes especially in the direction of the T waves. Such changes could be considered as evidence that precordial pain even though it may have been atypical, was of coronary origin. The changes may thus substanti-

ate the diagnosis of angina pectoris. If the changes persist and go thru a slower cycle of return they may be considered to indicate that the painful seizure was most likely associated with coronary occlusion of thrombotic origin with a resulting cardiac infarction. No striking, or even significant changes may appear in the electrocardiogram in an otherwise unquestionable case of cardiac infarction but such is the exception rather than the rule even when the curves are taken in the usual three leads. In a goodly proportion of such apparent failures the anteroposterior lead of Wolferth may yield a curve with significant changes. On the other hand occasionally the pain is slight and atypical and the physical findings so nearly normal that the diagnosis of cardiac infarction is made from the electrocardiogram entirely.

In suspected and unproven cases repeated electrocardiograms sometimes give support to the diagnosis in slight changes that are evident only when the interval curves are carefully compared. The progress of a definitely established cardiac infarction can in a measure be noted in the electrocardiogram especially during the first few days and weeks and some idea of the prognosis can often be gotten. The extent of the infarction can, however, only be surmised for its position is usually more effective than its size as far as the electrocardiogram is concerned. Occasionally only transient S-T interval changes are presented, but usually there are alterations that persist for months and years. Repetition of the recurrences of the coronary thrombosis are frequent and these exaggerate the electrocardiographic abnormalities and tend to make them more permanent.

Minute complexes after such an episode of persistent precordial pain or in patients with cardiac enlargement and failure are of poor prognostic significance. The size of the complexes does not indicate, however, the weakness or the strength of the heart beat.

There is unfortunately a growing tendency among those with a smattering of the fundamentals of the science, a brief experience and a high desire to popularize and commercialize the method, to read far too much into the interpretation of the electrocardiogram. Such men delude themselves by an uncritical attitude which fails to admit the limitations of the method. In general, in the absence of pathognomonic signs, regardless of the symptoms that the patient may present, with the possible exception of typical anginal pectoris, slight slurring or notching in the elec-

trocardiogram does not warrant the diagnosis of heart disease.

T wave negativity in lead III is, of course, not significant, and when it occurs in leads II and I it is to be accepted as bonified evidence of myocardial damage, only, however, after it has been determined for certain that the patient has not been receiving treatment with some digitalis preparation. In the absence of digitalization electrocardiograms showing T 1 and T 2 negativity; just as prolongation of the P-R interval beyond 0.20 sec. and of the Q-R-S beyond 0.08 seconds; a partial or complete auriculoventricular dissociation and absolute arrhythmia with no definite P waves and only irregular movements or regular circus movements of flutter; and runs or ventricular complexes; must be accepted as diagnostic of heart disease.

IN FOLLOWING THERAPY

The fact that some drugs, notably digitalis, atropin and quinidine, have definite and determinable effects on the cardiac mechanism makes the electrocardiographic method desirable for the graphic recording of and determination of the extent of the pharmacologic action of a given preparation. The question often arises as to whether a patient has actually received a digitalis preparation, and if so in what quantity. Effective digitalization results in T wave changes, even before other signs of beginning toxic action are present. Bigeminy or runs or ventricular tachycardia, prolongation of the P-R interval beyond 0.20 seconds, heart block at first partial or then complete often unsuspected clinically because of a high ventricular rate, are to be considered as signals of the limit of digitalis tolerance. During quinidine administration the spreading out of the Q-R-S complexes and the increase in the intraventricular conduction is to be considered a danger signal and calls for a halt in the administration of the drug. The changes in the circus mechanism and in the A-V conduction can be followed in no other way than in the tracing of the string galvanometer.

SUMMARY

The advantages of the electrocardiographic method have been outlined as conservatively as is

possible for an ardent enthusiast in the field. Electrocardiography is an indispensable adjunct in the training of the physician, the general practitioner as well as internist or clinician. The electrocardiograph is the instrument of precision and of choice for the cardiologist.

It must be admitted that an electrocardiogram is no more necessary in every patient with palpitation, breathlessness or fatigability than is a gastro-intestinal X-ray study in every patient with epigastric distress. In fact much the same sort of argument pro and con can be offered for the application of these methods.

In no case will the interpretation of string galvanometer tracings or curves in any way take the place of or substitute for a careful history and a routine physical examination. The information that the conscientious practitioner can obtain from his patient is of paramount importance.

The electrocardiographic check up, however, is highly desirable as often as is possible in the cases that the practitioner has previously studied carefully.

The electrocardiographic method offers much to him that has an opportunity to avail himself of it, as well as to those of his patients who can afford the added expense.

It is the method par excellence for the absolute analysis of the mechanism disturbances.

It may detect otherwise indeterminable changes in the myocardium following infectious diseases.

It aids in the differential diagnosis of cardiac valvular disease and congenital heart disease.

It often gives advance evidence of the myocardial changes incident to coronary arterial sclerosis, incident to hypertension and aging.

It usually yields pathognomonic signs in cardiac infarction as a result of coronary thrombosis.

In the management of cases, especially after infectious diseases, or those with chronic heart disease and under digitalis or quinidine therapy, the electrocardiographic method is of great value. It only occasionally yields evidence that can aid in establishing the etiology or the prognosis of a case of heart disease.



The Value and Limitations of the Roentgen Examination of the Heart*

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ONE of the first uses to which the roentgen rays were put, shortly after their discovery, was the examination of the heart. The air-filled lungs appeared to furnish an ideal background for the thick-walled, blood-filled heart, and a brilliantly contrasting shadow was readily produced. With improvements in technique, the utilization of the teleroentgenogram or "six-foot plate," and the development of orthodiagraphy, the roentgen diagnosis of heart disease has advanced to an amazing degree. There is, nevertheless, much misconception as to the actual use of this examination in clinical practice and a marked variation of opinion as to its value. This is well-illustrated by the fact that in most teaching hospitals and clinics the roentgen examination of the heart is almost a routine procedure in cases suspected of cardiac disease. The reverse is true in private practice where it is unusual for the roentgenologist to be requested to make an examination of the heart.

This discrepancy between teaching or clinic practice and that of the individual private practitioner is based upon a large number of factors. In the teaching clinic, for example, the roentgenogram is used in many cases as a check upon the percussion findings of the student. It is used to elucidate clearly the types of cardiac enlargement which may result from different kinds of heart disease. These are primarily teaching purposes, and are of no great importance in the conduct of any particular case. On the other hand, the private practitioner, once he has made a diagnosis of heart disease, is usually not much concerned with the finer details of diagnosis which it is thought the roentgenogram will bring him. There is little or no specific therapy in most cases, so that it appears to make little difference. Furthermore, most doctors have an abounding confidence in their ability to outline the heart on percussion and to interpret murmurs. This confidence would be sadly shaken if their findings were carefully checked by X-ray examination and autopsy, but in the absence of such checks they continue to make diagnoses, often without a sound foundation.

What can the X-ray examinations contribute

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to the conduct of any case of heart disease? First of all, it must be understood that the X-ray examination gives only information as to the size, shape and pulsations of the heart and of its various chambers. Changes in size and shape with respiration or posture, changes in pulsation, enlargements, distortions of shape, can all be clearly determined within certain limits. It should be understood then that the diagnosis of those diseases of the heart which do not produce any considerable change in these factors of size, shape, position, and pulsation will not be aided by X-ray examination except, perhaps, in a negative way.

The first consideration in any case suspected of heart disease is whether or not the patient has an organic lesion. This is not always easy to determine from the clinical examination. If the patient has an organic lesion which is producing symptoms of heart failure, the X-ray examination will almost invariably show an increase in the size of the heart. In the borderline cases this determination is not always easy because the normal size of the heart varies within wide limits. The roentgen examination, if carefully done, will determine the transverse diameter of the heart very accurately in almost all cases. The surface area of the heart may also be calculated in this way. By comparison with normal standards a very definite statement as to whether the size of the heart is normal or otherwise can usually be made. This is, of course, of great importance in determining whether or not a patient is suffering from organic heart disease, and this information as to size can not be obtained accurately in any other way. In the case of insurance examinations, for example, the importance of this determination can readily be recognized.

It must be borne in mind, however, that many cases of organic heart disease have very little cardiac enlargement. This is particularly true of certain old mitral valve defects which may give a very striking murmur without causing sufficient increased work to produce hypertrophy and dilation. This is also true of some congenital defects. In the early stages of a mild hypertension the same situation may obtain. A normal roentgenogram does not, therefore, rule out or-

ganic heart disease. If, however, the patient is having symptoms suggestive of cardiac failure, absence of an enlarged heart is of great significance. It is certainly very rare, if ever, that the heart fails without first enlarging, and the latter can always be detected by X-ray examination. Therefore, in a patient suspected of heart disease, who has symptoms suggestive of heart failure, the roentgen examination should always show an enlarged heart. In the absence of any such cardiac symptoms the X-ray examination may be negative, even though organic disease is present.

In cases of acute and subacute endocarditis, the roentgen examination may be of relatively little value. In these patients the symptoms and effects of sepsis are the most important factor, and the roentgen examination gives little or no information in this regard. Many of these patients do not have any cardiac failure during this stage, and may show nothing on X-ray examination, even though their general condition is most serious. On the other hand, in those cases which survive the acute attack, repeated X-ray examinations may clearly delineate the gradual increase in size of the heart which occurs as the valve defect becomes more and more marked. In that way a clear picture of the progress of the disease may be obtained.

In the case of hypertensive disease the effects of the disease upon the heart may be strikingly shown in the roentgenogram. Repeated examinations over a period of years will demonstrate most accurately the gradual enlargement of the heart, and give some idea, at least, as to the prognosis and the effectiveness of therapy.

The second determination to be made in any particular heart case is the type of disease which is present. This is of great importance because often the treatment and usually the prognosis is different in the different types of cardiac disease. This differentiation of types can be greatly aided by X-ray examination because of the changes in the shape of the heart which occur with the different pathological states which may be present. Each valve defect or other lesion tends to produce more marked dilation and hypertrophy of one chamber than another. This will produce changes in shape which are often perfectly characteristic. In mitral stenosis, for example, there is early an enlargement of the left atrium which can be beautifully demonstrated at a relatively early stage by examination in the lateral view with the barium-filled esophagus. The latter is compressed and posteriorly displaced by the enlarged left atrium. In ad-

dition there is enlargement of the right ventricle with dilation of the pulmonary artery and the conus pulmonalis. This produces a characteristic convexity of the left border of the heart. Congenital defects and obstructions of the pulmonary circulation may produce a pure right heart enlargement, and the distinction between these two types is often greatly aided by the roentgen examination. A third group shows marked concavity of the left border with enlargement of the left ventricle. These are due to aortic valvular disease or to hypertension. The distinction between aortic disease and hypertension is usually impossible from the roentgen examination. Occasionally coronary artery disease may also produce a similar appearance of the heart shadow. The fourth type of cardiac enlargement occurs with myocardial diseases such as occur with prolonged toxemia, myxedema, and occasionally hyperthyroidism. In these the heart becomes flabby, the chambers all dilate while the base of the heart remains narrow, giving a somewhat flask-shaped appearance.

It can be seen from the above that the roentgen examination may be very accurate in distinguishing mitral valvular disease from aortic valvular disease or from hypertension. It may also distinguish these lesions from those which produce enlargements of the right heart such as congenital defects and diseases of the lungs or pulmonary circulation. Often the distinction between pure myocardial disease and valvular lesions or hypertensive disease can also be made out. On the other hand, aortic valvular disease can rarely be distinguished from hypertension effects on the heart and coronary artery disease may also be confused with these two.

Disease of the coronary arteries such as sclerosis or thrombosis may give no X-ray findings whatever. Such cases may go on for years without causing any enlargement of the heart. In such an event the X-ray examination would be negative and of no value whatever. In certain cases of coronary sclerosis, however, the heart does become enlarged, as stated above, and thus produces some changes in the X-ray shadow of the heart. A negative roentgenogram, however, does not at all rule out coronary disease, and it is not at all uncommon to have a patient die from a coronary artery thrombosis shortly after a negative roentgen examination.

Many congenital heart cases show little or no cardiac enlargement. In these, obviously, the roentgen examination is of little value. It is often most astonishing to see a child with marked cyanosis without any change in the size or shape

of the heart, but this is perfectly consistent with the pathological physiology of many congenital defects. In other cases where actual enlargement of the heart is present changes in the shape may give little assistance in determining the exact type of congenital anomaly which is present. Certain lesions such as pulmonic stenosis, patent ductus arteriosus, or transposition of the large vessels may give a fairly characteristic picture, but on the whole, the roentgen examination is of relatively little value in this group of cases.

SUMMARY

In the practical conduct of cases of heart disease the X-ray examination is of value because it determines accurately the size and shape of the heart. This examination is of fundamental importance in:

1. The determination of the presence of an organic heart lesion.
2. The distinction between functional and organic heart disease.
3. The distinction between mitral valvular disease, aortic valvular disease or hypertension, congenital heart defects or right heart enlargements, and disease of the myocardium itself.
4. The determination of prognosis and the results of treatment as shown by the change in the size of the heart from time to time.

The roentgen examination is of little or no value in:

1. The diagnosis of coronary artery disease.
2. The distinction between aortic valvular disease and hypertension.
3. The diagnosis of many cases of congenital heart defects.

CORONARY ARTERY DISEASE

(Continued from Page 113)

TREATMENT

There is very little that is now unfamiliar to the average physician concerning the treatment of coronary artery disease. The nitrites are used to give temporary reliefs for attacks of angina. Theobromine and theophyllin compounds are recommended by many physicians and I believe help a few patients. The iodides still deserve a place in our treatment, and so does the judicious use of alcoholic beverages. Some recent

developments that are still in the experimental stage are injections of various muscle extracts, the therapeutic use of the X-ray and various surgical procedures such as alcoholic injections of the dorsal roots, cervical sympathectomy and dorsal ganglionectomy. What is more important is to outline a general program of daily activity that prevents the occurrence of attacks as much as possible. A period of rest directly after meals is advisable. Although it is generally impossible to do away with attacks entirely, they often can be diminished in frequency and duration.

The treatment of acute coronary thrombosis can be summarized briefly by emphasizing the early use of liberal doses of morphia for pain, a period of complete rest in bed for several weeks, and watchful attention to the possible complications that may arise. In this latter regard, oxygen may be of value to combat dyspnea and suffocation, adrenalin for severe heart block and quinidine for ventricular tachycardia.

When congestive heart failure develops in a patient who is regarded as having had a previous coronary thrombosis or has coronary artery sclerosis, it is treated in much the same way as is any patient with myocardial insufficiency i. e., by rest in bed, digitalis, diet, and properly selected diuretics when necessary.

PROGNOSIS

When it comes to estimating a prognosis in coronary artery disease, it is well nigh impossible to be dogmatic. The variations are extreme. One patient with angina in apparent good health may die in a few days, and another who seems to have been in no better condition may live for 10 to 20 years. Whenever the diagnosis of angina is correct it entails the liability and likelihood of sudden and unexpected death. The average length of life after the onset of symptoms is probably not more than four or five years. Much the same difficulty exists in estimating the prognosis of acute coronary thrombosis. A satisfactory recovery may take place after a most fulminating attack and a sudden exitus can occur during what seems to be a mild attack. The only general attitude that the physician should take in making a prognosis in cases with disease of the coronary arteries is to be always hopeful and yet always guarded.



The Management of Cardiac Failure of the Congestive Type*

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IN THE course of chronic organic heart disease, no matter what the etiological background may be, the onset of congestive failure is an event of major importance, since it marks clearly a milestone beyond which the patient must of necessity sink to a definitely lower level of physical activity, and, further, it dominates to a considerable degree both the prognosis and treatment of the individual case. The myocardium has indicated by unmistakable signs, either because of the underlying heart disease or of some superimposed acute episode, such as coronary thrombosis or an abnormal rhythm, that it is incapable of maintaining an adequate circulation in response to the demands placed upon it, and that unless the load can be significantly reduced by adequate rest or the deleterious factors inherent in the heart itself influenced appreciably by specific therapy an unfavorable termination cannot long be delayed. Any attempt to estimate the prognosis in an individual case is difficult, because of the multiplicity of factors concerned. In general it is true, however, that the faster the ventricular rate at the onset of congestive heart failure the more favorable is the prognosis. The successful management of this condition and the postponement of more serious disability is influenced in large measure by the ability to recognize and appreciate the earliest signs of congestive failure—signs which first appear not in the heart itself but in the peripheral circulation, and the importance of which has been repeatedly stressed by the English school, and by Sir Thomas Lewis¹ in particular, who points out that “those who desire efficiently to manage chronic cardiac cases should observe and consider very carefully how little is really gained, and how seldom there is any gain, by repeated auscultation of the heart sounds. Signs so obtained rarely change, they are not signs that indicate improvement or deterioration; but the symptoms and signs upon which emphasis has here been laid (i. e., peripheral signs of early congestive failure) do change frequently in one or two directions. They form the chief indications of the course the patient is pursuing and will

pursue, for they tell how the blood is circulating in the body generally under various conditions, and speak of the capacity of the heart to do work.” A sign of permanent importance at this stage is an increase in venous pressure, as indicated by observation of the cervical veins, and when definitely present is usually accompanied by other evidence of peripheral venous stasis; that is, slight engorgement and tenderness of the liver, moist râles at the lung bases, and slight pitting edema of the lower extremities. A protodiastolic gallop rhythm is an auscultatory sign of importance, and signifies ventricular dilatation and impending congestive failure. Breathlessness on slight exertion or even at rest is usually present. Thus, by an early recognition of these minimal signs and the prompt institution of rational therapy significant degrees of disability and discomfort may be prevented or, at least, postponed for a considerable length of time. It should be added, however, that important as heart failure may be it is but a late stage of heart trouble that should have been carefully studied with stethoscope and otherwise long before; prevention or delay in the appearance of congestive failure by appropriate measures is far more important than the treatment of the failure when it comes.

The measures available for the treatment of congestive heart failure may be conveniently considered under four heads, and include (A) Rest, (B) Digitalis and related drugs, (C) Diuretics, and (D) Other therapeutic measures, including diet, cathartics and special procedures. The therapy in a given instance must be determined largely by the needs and complications of the individual case.

REST

The most important therapeutic measure which we possess is rest, and the degree to which it should be enforced depends upon the extent of congestive failure present. If dyspnea is elicited only on moderate or unusual exertion, it is sufficient to restrict the patient's activities so as to avoid the exertion which produces symptoms. However, it is to be remembered that the maximum amount of exercise within the limits of the individual's capacity is of value in maintaining general health and strength and, furthermore,

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reasonable exercise is a distinct aid to the peripheral circulation. When definite signs of venous congestion are present, activity should be much limited, and with increasing degrees of congestive heart failure absolute rest is of prime importance. This is best accomplished with the patient in bed in as comfortable a position as can be arranged. A semi- or even an upright posture gives the greatest relief from distressing degrees of breathlessness, and can usually be obtained by some form of back rest and a proper arrangement of the pillows. If the patient is in a hospital, the Gatch bed with an adjustable back rest is desirable, and often for the severe case, where the treatment is to be undertaken at home, it is possible to obtain such a bed for temporary use from a hospital or from a supply house. Specially designed cardiac beds are now available, similar to the one proposed by Sir Thomas Lewis, which can be conveniently converted from the position of a bed to that of a chair with a minimum of disturbance to the patient; such a bed greatly facilitates the management of these cases. Occasionally in the home where special equipment is not available, the patient may be temporarily made more comfortable propped with pillows in a large arm chair, but here the tendency for massive edema to collect in the dependent lower extremities is a distinct disadvantage and it may accumulate to a degree requiring special mechanical measures for its removal.

When dyspnea is distressing, and such is usually the case in the presence of acute congestive heart failure of considerable degree, morphia is an invaluable drug and it should be given temporarily in amounts sufficient to insure both mental and physical relief. The rest and peace of mind after a good night's sleep insured by adequate amounts of morphia will often result in astonishing improvement; one-sixth grain every three or four hours is usually adequate and, of course, a change to milder sedatives as soon as possible is desirable. Codeine, various hypnotics, and brandy or whiskey are of value for certain special symptoms such as cough, restlessness, or mental distress.

In the treatment of cardiac failure rest should be mental as well as physical; all excitement, worry and disturbing visitors should be excluded.

DIGITALIS

Second only in importance to rest and the most valuable drug we possess for the treatment of congestive heart failure is digitalis. Although introduced 150 years ago by Withering for the treatment of edema it has been within

relatively recent years that its full value and rational use have been recognized, and recent evidence has been presented by Christian² which suggests that even now its true worth in the possible prevention of congestive failure may not be fully appreciated. This observer points out, and we believe rightly, that in the presence of organic heart disease with or without evidence of decreasing reserve, digitalis may increase the tone of ventricular muscle sufficiently to prevent in some measure the tendency of the heart to dilate and thereby postpone indefinitely the onset of congestive heart failure. Whether or not this concept is a correct one remains to be proved.

In general it is true that every patient with congestive heart failure should be fully digitalized and maintained thus by the administration of a daily ration of the drug after the total digitalizing dose has been prescribed. A few possible exceptions will be commented upon later. Complete digitalization consists in the administration of the drug in amounts sufficient to produce full physiologic effect on the heart as indicated by a slowing of the ventricular rate, improvement of the cardiac sounds, increased urinary output, and consequent diminution in the signs of peripheral congestion. If the toxic symptoms of anorexia, nausea, vomiting, xanthopsia, or bigeminal rhythm intervene, the drug should be discontinued for a few days. The amount of digitalis required for an average adult can be roughly gauged by the size of the individual, and in general amounts to 1.5 grains of the dried leaf per 10 pounds of body weight. It must be remembered that if the estimated digitalizing dose of the drug is given in divided portions over several days, allowance must be made for the average daily excretion of about 1.5 grains.

The rapidity of administration depends upon the need of the individual case. If there is considerable urgency, the dried leaf can be given in doses of 0.5 gram (five 1½ grain pills) every eight hours for three doses, each dose being equivalent to five cc. of the tincture. If there is less urgency, 0.3 gram (3 pills) may be given three times a day for two days. If the patient is ambulatory, we have found the following procedure satisfactory and one that is especially applicable to clinic patients attending the Outpatient Department; namely, 0.1 gram (1 pill) three times a day after meals for one week. With very sick patients it may be desirable to administer the drug intravenously and there are available several satisfactory preparations for this purpose. The total amount of the drug is the same as for medication by mouth and in most instances one

cc. of the intravenous preparation is equivalent to 0.1 gram of the dried leaf.

Once the patient has been fully digitalized by one of the methods outlined above, it is important that digitalization should be maintained by the administration of a daily ration of a small amount of the drug and continued indefinitely as long as there is need; this is often for the duration of life which may extend over many years. The average adult requires 0.1 gram (1 pill) a day; occasionally a little more of the drug is necessary and a convenient plan is to prescribe two pills on Sundays, or two pills on Wednesday and Sundays as the patient requires. A few patients can take less than one pill a day; for them 4, 5, or 6 pills a week may be adequate.

Strophanthin (ouabain) is a drug with digitalis-like action. It is rarely used except in emergencies, and is not without danger. When it is given it may be used in the dosage of $\frac{1}{4}$ to $\frac{1}{2}$ milligram (1/120 to 1/240 grain) intravenously every 24 hours but not within 48 hours after digitalis has been given; thus if an untreated case be encountered, strophanthin may be used instead of digitalis, but we have not found it necessary so to treat our cases.

DIURETICS

Usually slight or even moderate degrees of peripheral edema which are the result of congestive heart failure will subside fairly promptly following the institution of therapy as outlined above. However, in severe cases or when the edema is not quickly relieved it can usually be dealt with successfully by a number of drugs whose primary property is that of producing a diuresis. Important among these are certain of the purine derivatives, bismuth salts, certain chlorides and sulphates, and the more recently introduced mercury compounds.

By far the most effective diuretic in our experience is salyrgan (mersalyl)—a mercury-urea compound and a development from novasurol (merbaphen). It completes with digitalis and morphia a triad of drugs of outstanding value in the management of any patient with a severe degree of congestive heart failure, and is rapidly supplanting the milder and less effective diuretic drugs in the therapy of these cases. It has a powerful diuretic action and the degree of response is often astonishing. It is best given by the intravenous route in doses of 1 and 2 cc. once or twice a week, as necessary. Recently an instance has been recorded in which novasurol and salyrgan, but chiefly the latter drug, were ad-

ministered 270 times over a period of five years without losing their effectiveness and without unfavorable results to the patient.³ However, a few words of caution seem desirable. Care should be exercised to insure that the injection be made intravenously and not subcutaneously, for otherwise painful localized thrombosis and even sloughs may result. If necessary the drug can be given intramuscularly, but never subcutaneously. Recently Dressler⁴ at the Heart Station in Vienna has given it intraperitoneally in the presence of ascites, with equally as effective diuretic results. Toxic symptoms, although rare, must be guarded against; these in our experience have been confined to mild mercurial stomatitis. It is probably unwise to employ the drug in the presence of extensive renal damage. It is our opinion that the introduction of salyrgan and novasurol represents the one outstanding advance in the therapy of congestive heart failure during the past ten years, and we have reason to believe that the true value of these drugs is not sufficiently appreciated by physicians in general practice, for combined with digitalis they are often the means of maintaining comfort and prolonging life for a surprising length of time. It is usually wise, however, unless the case is an urgent one, to employ first the milder diuretic drugs by mouth.

Less effective, but nevertheless important drugs because of their diuretic properties, are those of the purine group, of which there are a large number. They have the advantage of oral administration, but also the disadvantage of being very likely to cause toxic symptoms, chiefly nausea and vomiting, if given in amounts sufficient to produce a significant diuresis. Theobromine sodium salicylate (diuretin) or theobromine calcium salicylate (theocalcin) are often effective with little or no gastric irritation. They may be given in 10 to 15 grain doses three times a day for two or three days and repeated as necessary. Theocin in 5 grain doses may be given in similar fashion. In addition there are several proprietary preparations containing a purine derivative in combination with other compounds which often give good results and little gastric disturbance. Various salts of ammonium, magnesium, and calcium, and urea have a certain amount of diuretic action, but in general there is nothing to be gained over the effect from the use of the two groups mentioned above.

In a recent communication Miller and Feldman⁵ reported fairly successful results by the use of urea as a diuretic in selected cases and over long periods of time, but the supplemental use

of other diuretics was necessary from time to time. They reported the unbroken administration of urea over periods of three years with no apparent impairment of kidney function or alteration in histologic structure. The outstanding disadvantages in the use of this drug, however, are the relatively large doses required (10 to 25 grams two or three times a day) and its unpleasant taste.

OTHER THERAPEUTIC MEASURES

Diet—The importance of diet has perhaps been overemphasized in the past and especially its salt-free aspect. Provided certain restrictions are kept in mind, the role of diet in the treatment of congestive heart failure is a relatively minor one. It should be light and simple and consist as far as possible of those articles of food which are easily digested and which the patient likes, remembering that while at rest in bed the total calorie requirement is at a minimum. Such articles as soft bread, milk toast, cereals, ice cream, and fruit juices are usually well tolerated. Salt in excess is to be avoided when edema of considerable degree is present, but it is usually not necessary to restrict it further than the omission of a salt cellar from the patient's tray. In cases where there is much edema the diet originally recommended by Karell may be of value for a day or two. It consists of 200 cc. of skimmed milk four times a day without other food or liquid. Most patients, however, after two or three days will require more food and fluid for comfort, and with improvement in the general condition of the patient a light mixed diet of 1500 to 1800 calories is suitable, the details to be determined largely by the tastes and economical status of the individual. As for fluid, it is desirable to restrict it more or less in proportion to the amount of edema present, and if the latter is extensive the total intake should not exceed 1000 cc. in twenty-four hours. It is best to avoid effervescent liquids which may cause disagreeable distention of the stomach. Perhaps the most satisfactory and accurate means of determining the effectiveness of therapy when edema is present is by following the weight of the patient from day to day. And, finally, it is important to keep in mind that edema may sometimes result from starvation; that is, too little protein in the diet.

Catharsis—By the proper regulation of the bowels and by a suitably selected diet abdominal distention may in a large measure be avoided. In active patients long confined to bed there is almost always a tendency to constipation, and in patients with congestive heart failure this is aug-

mented by the congested state of the abdominal viscera. During acute attacks of congestive failure, and while the patient is very ill, the use of an enema when necessary to evacuate the bowels is the most desirable method. Later and with improvement most patients respond satisfactorily to mild laxatives, such as cascara or jalap. Occasionally a brisk purge for one or two days with magnesium sulphate or calomel serves the two-fold purpose of clearing out the gastro-intestinal tract, and at the same time of eliminating a considerable amount of fluid by this route. However, for the sole purpose of eliminating fluids diuretics are more effective and much less prostrating to the patient.

Southey's Tubes—In certain patients with massive edema which remains stationary in spite of adequate medical treatment of rest, digitalis, and diuretics, it may be necessary to employ special measures to remove the fluid from the dependent parts, not alone for the symptomatic relief which the mechanical removal of the dropsical fluid affords, but also for the relief of an additional burden to the already overtaxed and failing circulatory system; furthermore, the partial removal of what has been designated by Galli⁶ as the "peripheral barrier" to the circulation favors a more adequate resorption of the remaining fluid by subcutaneous veins and lymphatics which have previously been embarrassed by pressure in the edematous regions. Acupuncture and scarification may give excellent results so far as the removal of fluid is concerned, but the danger of infection in the already more or less devitalized tissue is considerable, and the uncontrolled drainage of large amounts of fluid directly into dressings and thence into the bed is a serious disadvantage. Therefore, feeling that there is a real need in certain selected cases for some suitable method of dealing with this distressing situation, we have recently revived the use of Southey's tubes, and they appear to be the safest and most satisfactory means of treating obstinate edema. A full and detailed description of both the tubes and the method of using them has been given in other publications^{7 8} and a repetition is out of place here; suffice it to say, however, that the amount of fluid obtained in this manner is often remarkable, and the relief afforded the patient is considerable, even though it may be temporary. Only a few weeks ago 1500 cc. of fluid were removed in four hours by means of a single tube from an edematous scrotum; this was followed by an extraordinary subjective improvement in the patient's outlook.

Paracentesis—During the course of congestive

heart failure, fluid often collects in the chest or abdomen. Moderate amounts will usually disappear fairly quickly with subsidence of edema elsewhere, and with improvement in the general condition of the patient. If fluid accumulates, however, in amounts sufficient to embarrass the respiration or cause uncomfortable abdominal distention, it should be removed by paracentesis.

Venesection—The removal of 250 to 500 cc. of blood as an emergency measure appears occasionally to result in temporary improvement. It is not often necessary to resort to this procedure, but in the presence of marked venous engorgement and cyanosis it is worthy of trial; especially at the time of pulmonary edema, the result of acute heart failure, it may prove to be a life saving measure.

FURTHER COMMENTS

Finally, a word remains to be said about acute pulmonary edema and cardiac asthma and certain special conditions which may be complicated by congestive heart failure, conditions in which both the therapy and the response to treatment may be very different from the usual course.

Acute pulmonary edema and cardiac asthma are the result of acute pulmonary engorgement dependent primarily upon left ventricular failure and, therefore, complicate those conditions, notably chronic hypertension and cardiovascular lues with aortic regurgitation, in which the chief load is borne by the left ventricle. They not infrequently follow acute coronary thrombosis also. During the acute episode full doses of morphia give the greatest relief. If cyanosis is prominent and venous engorgement marked, and such is usually the case, the removal by venesection of three or four hundred cc. of blood as an emergency measure may tide the patient over the period of acute failure and prove to be a life saving procedure. Complete digitalization followed by a daily ration of the drug is indicated, and often patients who continue to have frequent attacks of cardiac asthma in spite of digitalis and bed rest show considerable improvement following the use of salyrgan intravenously even though definite signs of peripheral edema be absent.

Congestive failure in children under the age of twelve years is a serious complication and the result of severe myocardial damage from an overwhelming general infection. The outlook is frequently, although not necessarily, fatal; but though the child survive the acute episode the heart is usually seriously crippled for the remainder of a relatively short life. Rheumatic

fever is the most common etiological factor and the response of this type of case to digitalis therapy is notoriously unsatisfactory. At the House of the Good Samaritan in Boston where a large number of rheumatic children are cared for during the active stage of the disease, we have been unable to observe demonstrable improvement which we felt could be reasonably attributed to digitalis alone. The chief and probably only hope for improvement in the congestive failure in these patient is dependent upon subsidence of the general infection and the future course depends in large measure upon their ability to avoid recurrences of active rheumatism.

Similarly, congestive heart failure which may complicate the long standing and severer states of hypo- and hyperthyroidism depends certainly in large part upon the underlying abnormal metabolic state rather than upon any factors inherent in the heart itself. Here, again, specific cardiac therapy is in large measure ineffective. Of prime importance is treatment of the underlying disease.

In conclusion it is important to remember that every patient with the signs and symptoms of congestive heart failure presents a major therapeutic problem. The intelligent and successful management of the individual case involves a careful consideration of the etiological background the treatment of which may be as essential as measures directed to the relief of the failure itself.

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CYANOSIS AND DYSPNEA

(Continued from Page 122)

the capillaries, as by cuffs around the extremities or vasodilator drugs will cut short a paroxysm, according to this investigator.

The cyanosis so commonly found in congenital heart disease (35-50%, Wright) has been discussed in an earlier paragraph.

Pulmonary Disease—Cyanosis may be the outstanding symptom of lobar pneumonia and of other massive pulmonary lesions if the blood continues to pass through without receiving oxygen, and joins the arterial blood while still

in a venous state. The cyanosis of bronchopneumonia and some stages of lobar pneumonia is due to interference with oxygen intake in the alveoli, shallow breathing, oxygen lack in the tissues and disturbances in the chemistry of the respiratory centre. The replacement of alveolar air is at fault in emphysema and asthma. Traumatic shock with its vasodilatation, retardation of blood flow and oxygen supply to the tissues and malnutrition of the respiratory centre displays both dyspnea, especially of the type with cyclic respiration, and cyanosis.

Oxygen Administration—If the anoxemia or cyanosis is due to insufficient oxygen pressure in the alveoli the administration of oxygen is indicated. In pneumonia and other pulmonary conditions where the alveolar wall does not permit free diffusion of gases and increase of the oxygen concentration will overcome the barrier and bring the oxygen content of the arterial blood to an adequate level for tissue supply.

In cardiac failure where the edema of the lungs has the same effect an excess of oxygen will permit alveolar penetration, tissue oxygenation and revival of a failing respiratory centre. Oxygen may be of value to tide the patient over a crisis, as in coronary thrombosis but is not employed so often in congestive failure on account of the permanence of the underlying cardiac insufficiency.

Oxygen administration cannot be expected to influence the cyanosis of congenital heart disease, or of lobar pneumonia where there is a shunting

of the venous blood to the arterial stream, for no matter how well the alveoli are ventilated the venous blood will join with the arterial and so bring about cyanosis. Only if edema of the lung is a partial cause of the cyanosis could excess oxygen influence it.

In high altitude anoxemia and in carbon monoxide poisoning oxygen inhalation is effective. Carbon dioxide inhalation acts by stimulating the respiratory centre to action thus hyperventilating the lungs. An excess favors the stimulation of the failing respiratory centre which is too depressed to respond to the usual concentration of carbon dioxide and given along with oxygen spurs on respiratory activity so that the excess of oxygen can be taken in and utilized. Increasing knowledge of the physiology of respiration leads to more ingenuity and accuracy in the use of these gases to control cyanosis and dyspnea and to prevent the permanent tissue damage caused by prolonged oxygen want in the tissues.

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The JOURNAL LANCET

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North Dakota State Medical Association
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' Assn.
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MINNEAPOLIS, MINNESOTA, MARCH 1, 1933

HEART DISEASE AND THE GENERAL PRACTITIONER

In the past quarter century the human heart and its system of blood vessels have been subject to graver concern and deeper scrutiny than any other organs or diseases whose diagnosis and treatment make up the sum of the physician's skill in general medicine.

Realizing that a vast store of new knowledge has been accumulated in this brief span of years, and appreciating that a new basic science in the diagnosis of heart ailments has already flowered, the general practitioner often feels woefully inadequate from the point of view of equipment and equally at sea in theory when he attempts to breast the most recent conceptions of cardiac disturbances.

Yet the general practitioner—the family physician—must act as the profession's vanguard in attacking the high death rate credited to heart disease. For the general practitioner first comes in contact with the cardiac cases.

Hardly a day passes but that some newspaper, playing taps at the death of a prominent man, ends its trumpeting with the sad, low note: "He dies of causes said to be heart disease." The tremendous publicity spreads given over to the prevention of tuberculosis and cancer do not move the public mind with half the force that is packed in that ominous, matter-of-fact,

recurring statement: "Dead of heart disease." At the phrase, hypochondriacs and many other persons besiege their physicians to examine them and allay the fear of sudden death from heart failure.

Faced with the task of examining such a class of individuals, the practitioner of medicine soon realizes the need as well as the difficulties of an exhaustive medical examination which will properly evaluate the status of the patient's cardio-vascular system. With a knowledge of heart disease founded for the most part upon the presence or absence of murmurs or irregularities of the pulse, the busy general practitioner discovered that this yardstick of knowledge is not sufficient.

Yet the growing menace of cardiac disease in the prime of life makes it especially important that the family physician should know the signs and symptoms of these middle life types of heart disease, since rarely do they manifest themselves by clear-cut physical signs.

With this thought in mind the present symposium on heart disease has been arranged in this issue of THE JOURNAL-LANCET. It is hoped that the discussion will stimulate interest in this perplexing subject and promote a better understanding of the various manifestations of heart disease.

T. Z.

DR. GILBERT COTTAM

The Editorial Board is greatly pleased to announce the election of Dr. Gilbert Cottam to its membership. Dr. Cottam, a graduate of St. Louis University, practiced surgery in Sioux Falls, South Dakota, for approximately twenty years. During this time he held membership in all of the worth while local, regional, and national medical associations, such as his county and state societies and the American Medical Association. He has been president of the South Dakota State Medical Association and the Sioux Valley Medical Association. He is a fellow in the American College of Surgeons.

Since moving to Minneapolis to practice his profession, he has made a large number of friends in the medical profession and takes a very active part in the county medical society. Dr. Cottam has always manifested much interest in medical education and is an excellent student, as evidenced by the liberal space accorded him in Who's Who in America. This, together with his long practical experience in medicine and the loyalty he has always manifested toward THE JOURNAL-LANCET, qualifies him unusually well for his position on the Editorial Board.

LIEN LAWS IN ACCIDENT CASES

A year ago, in an editorial entitled "Fee Collection in Accident Cases," we called attention to the fairness of a Montana statute that gave physicians liens on any judgments, settlements or insurance, obtained by the injured persons by reason of such injuries.

A proposed Lien Law will come before the Minnesota State Legislature at this session, which provides that within ten days after an accident case leaves the hospital a lien may be filed with the Register of Deeds so that if a settlement or verdict is forthcoming, the hospital must be paid before final judgment can be rendered. This bill which was sponsored by the legislative committee of the state hospital association of which Mr. Drummond, of the Worrell Hospital at Rochester, is chairman has been referred to the banking committee.

When judgments are obtained based in a considerable measure upon the size of the "doctor bill" that must be paid, there should be some way of enforcing such payment, but even in this proposed bill the doctor seems to have been left out altogether. Perhaps it is true that similar bills have failed to pass in some other states with the doctor's bill attached to it, but that's no reason why it should in Minnesota. We have seen bills pass before that failed in many other states.

Assuming that there is no objection, the matter is hereby referred to the legislative committee of the Minnesota State Medical Association.

A. E. H.

PROGRESS IN TUBERCULOSIS
RESEARCH

For about six years a medical research committee of the National Tuberculosis Association has been carrying on investigations in the field of tuberculosis. On July 13, 1932, Dr. Kendall Emerson, managing director of the National Tuberculosis Association, prepared the following statement concerning the four most outstanding accomplishments of this committee to date: "1. Pure protein tuberculin: The outstanding achievement of the Research Committee is the production of tuberculin in a pure crystalline protein form. This has been developed through the careful work of Dr. Florence Seibert under Doctor Long's direction in the University of Chicago. Its chief advantage is the possibility of its complete standardization which adds greatly to the value of the tuberculin test as a comparative diagnostic procedure on a large scale in different parts of the country. 2. X-ray: Under grants through the Research Committee work has proceeded in the standardization of X-ray technique at the Henry Phipps Institute and the University of Pennsylvania. This work is under the direction of Doctor Maurice McPhedran and Mr. Charles Weyl and has resulted in standard procedures which are gradually being adopted and which insure comparable technique in all adequately equipped tuberculosis centers. 3. The continuing chemical fractioning of various strains of the tubercle bacilli and allied acid fast groups is leading to a more definite knowledge of the pathological effect of the various constituents of the germs grown in vitro. While this may not correspond exactly to the development of the tubercle bacillus in the living body, information thus gained is most helpful in the study of the well recognized symptoms presented by a case of tuberculosis. The ultimate hope is that through these means some chemotherapy may be devised which will meet the symptoms presented and possibly affect favorably the underlying pathological conditions. 4. An outstanding result of the Research Committee has been the development of a co-ordinated research on a single topic, the tubercle bacillus, and the assignment of specific problems to those universities or laboratories best equipped to study them. The results of such studies are correlated by frequent

meetings of the Research Committee and reports from various laboratories. A further value is the ethical relationship which has been fostered between commercial research laboratories and similar institutions attached to universities. Such a pooling of research resources in the country is a long step forward in the rational organization of biochemical research."

The use of pure protein tuberculin is on trial. Whether it will eventually be substituted for the tuberculin now in use will be determined entirely by careful observation. Certain questions arise in the minds of many tuberculosis workers which only close observation can answer. For example: Is it possible to produce pure protein tuberculin in quantities and with a guaranteed stability at a reasonable price? There is no question about the stability of old tuberculin nor is there any question about its specificity, nor should there be any question about the presence of other substances than protein from tubercle bacilli it contains interfering in any way with the test or causing any harm to the person tested because of the extremely minute amount introduced with each test. With old tuberculin it is necessary to standardize each batch because of some variation in potency. This is done physiologically. Pure protein tuberculin is standardized chemically but each succeeding batch must also be standardized physiologically as a control measure, unless it can always be prepared with the same potency no matter from what cultures it may be derived. Another important point is that pure protein tuberculin must be prepared so that it will keep clean and uncontaminated in the higher concentrations as old tuberculin does. If observation shows that pure protein tuberculin can be produced at slightly or no greater expense than old tuberculin, and can be prepared in uniform strength, in all probability it will replace old tuberculin. Until this time arrives old tuberculin is a reliable diagnostic agent and as safe as ever.

Pure protein tuberculin is now being produced and marketed by the Mulford Laboratories of Sharpe and Dohme under the name of MA 100. The Parke-Davis Company is making protein tuberculin available in a dry soluble form which has been prepared in accordance with the method originated by Dr. Seibert of the University of Chicago. This is to be distributed in tablet form of such size that when one tablet is dissolved in 1 cc of diluent, 0.1 cc contains the necessary dose. Two strengths of tablets are to be available.

J. A. M.

VETERANS' RELIEF FIGURES

There were so many figures in Administrator General Hines' report before a joint congressional committee last December that no one could be expected to remember them all.

One of the most startling statements was that comparing payments of benefits to war veterans in the United States, Great Britain and France. "Based on the number reported as either dead or wounded, the annual expenditure of Great Britain is \$58 per man; of France, \$51, and of the United States, \$2,668."

Page the medical care cost committee and save it from innocuous desuetude. Canst not think of several belated sentences that should be followed by unmistakable interrogation signs? And surely here's an opportunity for that *pro bono publico* type of organized analytical acumen that we have become so accustomed to defer to, in every new and baffling emergency of late. Yes, 58, 51 and 2668, are the figures, and that's all we started out to say. What's that? You want to write the rest of this editorial? Delighted! You certainly can.

A. E. H.

AFTER MARCH 4th WHAT?

Medical men are intensely interested in the "Dawn of a Tomorrow."

Only twice in forty years have we had political parties with political issues; other elections have been contests between the Republican party, which was in, and the historically discredited Democratic party, which wanted to get in. Contests between two masses of pork barrel seekers, or, to put it more politely, between two masses of wealthy gentlemen who wished to direct the high American finance for a consideration, and what a consideration!

The Bryan issue was 16 to one silver. The Roosevelt issue is anti-prohibition, reduction of tariff, public utility control of, at least, electrical power, more conciliatory foreign policies, especially in the far east.

Roosevelt is not too much committed and reasonably unfettered, yet, he is handicapped somewhat by the debt he owes to McAdoo, Hearst, Young, Reed, Taylor, and others, who collectively taken, are distinctly for the classes and about as progressive as the Stone Age or Bull Montana.

Roosevelt was elected, not by the Democratic votes, but with these votes plus the votes of the radicals, progressives, and a great number of despairing American citizens, who wished the

ballot, and not the mob, to correct existing wrongs.

Liberty exists only where equality exists. A nation, and not a few ultra-rich, is now in the saddle and the past flagrant abuses will not be tolerated. Americans are profound idealists, and, by the same token, there is an awakening skepticism or radicalism with newly born determination and a distinctly ugly temper.

A statesman great enough can mould this mass of humanity into warriors of steel for a prosperous America. Such a man must offer his political, and possibly his physical life, to this cause. He must war on industrial autocracy, Wall Street, corruption in all government departments, the vested interest of the gangster and racketeer, and, at first, be resigned to be as popular as an epidemic of uncinariasis. Roosevelt has shown genius as a politician; remember his blood is fighting blood, and, while his heritage and his Harvard training is against it, there is enough of the Jeffersonian liberal in him to make it possible for him to become the champion of the people who elected him, and eschew the easy path of ease and acquiescence. If so, with the advice and counsel of such men as John W. Davis, Alfred E. Smith, Morris Cohen, Brandies Lewis, Edmund Wilson, Hendrick Shipstead, and why not, Miss Frances Perkins, he may become second to no man among American great.

The whole world waits to salute such a statesman. We are due for deep reconstruction! Why not heed the writing on the wall now?

C. D'A. W.

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. N. Currie has moved from Glasgow to Malta, Mont., where he has opened offices for general practice.

Dr. A. M. Limburg, Fargo, has been re-appointed Superintendent of Health for Cass County for the year 1933.

Dr. Kent E. Darrow, Fargo, was the guest speaker before the members of the District Medical Society at Grand Forks last month.

Dr. Arvid E. Carlson, a graduate of the University of Minnesota in 1931, has decided

to locate at Warren, Minn., for general practice.

Dr. O. E. Belcourt, who was in active practice for over 30 years at Argyle, Minn., died recently after an illness of a few weeks at the age of 80 years.

Dr. E. L. Tuohy, Duluth, was elected to the Board of Governors of the American College of Physicians at the annual meeting recently held at Montreal.

An extension to the Battle Mountain Sanitarium at Hot Springs, S. D., will provide a 60-bed unit, a modern operating room, and an X-ray department, at a cost of about \$135,000.

Dr. G. M. Williamson, Grand Forks, N. D., was installed last month at the annual meeting held in Chicago as president of the Federation of State Medical Boards of the United States.

Dr. J. F. Blair, one of the prominent physicians and surgeons of Montana, died at Bozeman last month, after an illness of several months, the result of a hemorrhage of the brain.

Dr. L. G. Smith, Mandan, N. D., has taken in a partner, Dr. D. T. Watson, who will make a specialty of surgery. Dr. Smith will continue as a specialist in eye, ear, nose and throat practice.

At the annual meeting of the Minnesota State Board of Health, Dr. N. G. Mortensen, St. Paul, was elected president, Prof. F. H. Bass, University of Minnesota, vice-president, and Dr. A. J. Chesley, Minneapolis, executive secretary.

The members of the Kotana Medical Society held their annual meeting this month at Williston, N. D., and elected officers, as follows: Dr. W. A. Wright, president; Dr. L. B. Dochterman, vice president; Dr. I. S. Ab Planalp, secretary.

Mrs. J. B. Atchison, widow of the late Dr. J. B. Atchison, who had been in active practice at Helena, Mont., for over 50 years, died January 30th. Mrs. Atchison was well known in all parts of that state for her charity work in the early pioneer days.

The Montana State Board of Health new officers for 1933 are: Dr. B. L. Pampel, Livingston, president; Dr. G. M. Jennings, Missoula, vice president; Dr. W. F. Cogswell, Helena, secretary; Drs. E. G. Balsam, Billings; L. H. Fligman, Helena; E. M. Porter, Great Falls, directors.

The meeting held at St. Cloud last month, of the Stearns-Benton Medical Society, brought out a large attendance of members, as they had three Minneapolis doctors on their program, Drs. R. P. Scammon, N. O. Pierce and J. M. Hayes.

A bill introduced in the Minnesota legislature to amend the workmen's compensation act proposes to add the list of compensable occupational diseases carbon monoxide poisoning, dermatitis or any skin affliction, and silicosis or pneumoconiosis.

A bill presented in the South Dakota legislature proposes to accord to physicians, nurses and hospitals, caring for persons injured through the fault of another, liens on the claims and causes of actions and judgments or settlements accruing to the injured persons on account of such injuries.

Dr. W. H. Subera, one of the earliest settlers and pioneer physicians of South Dakota, died at his residence at Sioux Falls, after a short illness of influenza, last month. Dr. Subera has always been active in hospital work, having established the first hospital in that state. The remains were taken to Toronto, Canada for interment.

Dr. A. E. Wilcox has been elected president of the staff of Abbott Hospital, Minneapolis; Dr. F. H. K. Schaaf, vice-president, and Dr. George D. Eitel, secretary. Members of the staff executive committee are Dr. O. S. Wyatt, Dr. R. A. Johnson, Dr. K. Phelps, Dr. Ray Swanson and Dr. Cecile Moriarity.

A bill to license naturopaths was killed by the Minnesota legislature after it rejected a minority report. This report drew the fire of many house members, who declared the bill was only introduced to give 14 men in Minnesota the right to practice medicine without passing the basic science examinations.

The officers named for the coming year for the Grand Forks District Medical society are: Dr. F. E. Weed president; Dr. M. B. Ruud, vice-president; Dr. R. E. Leigh, treasurer; Dr. R. T. Lohrbauer, secretary; Drs. Moore, Tompkins and Ruud, delegates to the state meeting, and Drs. French, Witherstine and Woutat, censors.

A number of out-of-town doctors were in attendance at the February meeting of the Sioux Falls District Medical Society held at Sioux Falls. The principal talks were given by Dr. Anatole Kolodny on "Brain Tumors," with a clinical diagnosis, and Dr. H. L.

Billig, Los Angeles, on "A New Method of Anesthesia."

The Minnesota Pathological Society of the University of Minnesota Medical School Institute of Anatomy presented the following program last month on the evolution of tuberculosis in the human being: "First Infection Type of Tuberculosis," Dr. C. A. Stewart; "Re-infection Type of Tuberculosis," Dr. J. A. Myers.

Members of the Sioux Valley Medical Society elected the following officers at the annual meeting held at Sioux City, Iowa. Dr. S. A. Slater, Worthington, Minn., president; Dr. E. L. Perkins, Sioux Falls, S. D., first vice-president; Dr. C. C. Tellese, Wynot, Neb., second vice-president; Dr. W. R. Jepson, Sioux City, Iowa, secretary; and Dr. W. R. Brock, Sheldon, Iowa, treasurer.

At the monthly meeting of the Minnesota Academy of Medicine held at the Town and Country Club, St. Paul, on the evening of February 8th, the following program was presented: "The New Surgery of Bladder Neck Obstruction, Instruments and Methods," Review of Cases, by Dr. Frederic E. B. Foley, St. Paul. "Trichomonas Vaginalis," by Dr. William H. Condit, Minneapolis.

The mysterious disappearance of \$5,000 worth of radium from the Luther Hospital, Sioux Falls, S. D., continued to baffle officers and hospital authorities after an intensive and scientific hunt had been conducted for the valuable element. Contained in a specially constructed receptacle approximately four inches long and one inch thick, the radium disappeared from the hospital on January 14.

Dr. A. W. Ide, St. Paul, chief surgeon of the Northern Pacific Railway, read a paper on "Fractures of the Spine," at the regular meeting of the Sixth District Medical Association at Bismarck. About 40 members of the association and eight guests attended. Dr. Ide used a collection of lantern slides, X-ray films and a reel of motion pictures dealing with treatment of fractured vertebrae to illustrate his paper.

The medical profession has made a definite contribution to the present economic condition of the country in lowering its fees in sections where this has been done. This statement was made by Dr. R. G. Leland, Chicago, Director of the Bureau of Medical Economics of the American Medical Association, who was in St. Paul to attend the annual confer-

ence of secretaries of the Minnesota Medical Association which was held last month.

Dr. B. F. Bailey, Lincoln, Neb., was elected president of the Northwest Regional Medical Conference at its annual meeting at St. Paul on February 18. Dr. Harold Camp, Monmouth, Ill., was chosen secretary. The Northwest Conference is an organization of officers of state medical associations in the northwest which meets annually to discuss mutual problems. Dr. J. F. D. Cook, Langford, S. D., was the retiring president. About 50 members were present.

At the annual meeting of the Aberdeen District Medical Society, the following program was given: "Pathology of Bladder Neck Obstruction, Particular Reference to Cystoscopic Prostatectomy." Philip F. Donohue, M.D., St. Paul. "Ectopic Pregnancy." I. R. Salladay, M.D., Pierre. "Traumatic Surgery of the Extremities—A Movie." E. A. Pittenger, M.D., Aberdeen. After this program, the following officers were elected for 1933: F. J. O. Kraushaar, president; Dr. E. A. Pittenger, vice-president; Dr. John L. Calene, secretary.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minne-

apolis 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 program for the month of March will be as follows: March 1, "Hypertension"; March 8, "Cause of Burns"; March 15, "Difference in Health Problems of Men and Women"; March 22, "First Aid in Sprains and Fractures"; March 29, "Tumors of the Breast."

BOOK NOTICE

FUNCTIONAL DISORDERS OF THE GASTROINTESTINAL TRACT, by William Gerry Morgan, with 259 pages. (Everyday practice series, ed. by Harlow Brooks.) Philadelphia and London, J. B. Lippincott Co. Copyright 1931. Price, \$5.00.

This treatise is written by one evidently skilled in the care of patients with disorders of the gastro-intestinal tract. Dr. Morgan, active in the practice of gastro-enterology, has prepared his book for the purpose of aiding the general practitioner whose duty it is to care for these persons. Though not forceful, the style is direct and the many useful hints and suggestions are amplified by numerous case history summaries. The work is a useful one.

T. A. PEPPARD, M. D.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, FEBRUARY 7, 1933

BY EXAMINATION
(January)

Name	School of Graduation	Address
Addington, Ercell Adelbert	U. of Minn., M.B., 1931, M.D., 1932	St. Croix Falls, Wis.
Brock, William George	U. of Manitoba, M.D., 1930	619 4th St. S. W., Rochester, Minn.
Butsch, Winfield Louis	U. of Buffalo, M.D., 1930	Mayo Clinic, Rochester, Minn.
De Lien, Horace	U. of Minn., M.B., 1932	Fairview Hospital, Minneapolis.
Gianturco, Cesare	U. of Naples, Italy, 1927	Mayo Clinic, Rochester, Minn.
Ginsberg, Stewart Theo.	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Herbst, Richard Fred	U. of Minn., M.B., 1932	St. Mary's Hospital, Minneapolis.
Ingels, Arne Ely	U. of Oslo, Norway, 1922	Mayo Clinic, Rochester, Minn.
Judd, Walter Henry	U. of Nebr., M.D., 1923	Mayo Clinic, Rochester, Minn.
Loken, Theodore	U. of Nebr., M.D., 1932	Fairview Hospital, Minneapolis.
Porcher, William J. L.	U. of Minn., M.B., 1932	Detroit Receiving Hospital, Detroit, Mich.
Seashore, Rosel Theo.	U. of Minn., M.B., 1932	Miller Hospital, St. Paul.
Steffens, Lincoln Felch	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Tanglin, Walter Geo. Ludwig	U. of Minn., M.B., 1931, M.D., 1932	Mahnomen, Minn.
Tomlinson, Harry Coleman	Washington U., M.D., 1931	4250 West Broadway, Robbinsdale, Minn.
Troost, Henry Bradley	U. of Minn., M.B., 1929, M.D., 1932	Mankato, Minn.
Wallace, Martin Olmsted	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Wingquist, Carl Gustave	U. of Minn., M.B. and M.D., 1932	693 York St., St. Paul.

BY RECIPROCITY

Steube, Ronald Walter	U. of Buffalo, M.D., 1931	Alexandria, Minn.
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Spontaneous Rupture of the Myocardium

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SPONTANEOUS rupture of the myocardium is one of the rarer recognized forms of termination in diseases of the heart. Krumbhaar and Crowell in 1925 reported 22 cases and reviewed all previously reported cases, bringing the total to 654. In 1928 Davenport added 92 cases and Beresford and Earl in 1930 added 46 cases. That the condition is not a common one is shown by necropsy statistics. Krumbhaar and Crowell found 7 out of 16,000 autopsies; Romeik found 7 in 13,000; Smith and Bartela of the Mayo Clinic found 7 in 6,000; Locke found one case in 4,076 autopsies at the Massachusetts General Hospital, and 5 cases in 5,800 autopsies at the Boston City Hospital. Undoubtedly, more autopsies on subjects past the fifth decade of life dying suddenly, would reveal a higher incidence of myocardial rupture.

Most of the reported cases as shown by Davenport's statistics, appeared after fifty years of age, and justly so, as it is after this period that the degenerative changes of the cardiovascular system, as arteriosclerosis and fatty degeneration appear. In the vast majority of cases, examination has disclosed that the rupture has occurred through an infarcted area, the direct result of coronary occlusion. The extent of necrosis, the ability to repair and the rapidity of repair, the degree of previously existing myocardial degeneration, the

intracardiac pressure, and the situation of the infarct are important factors in determining the end results of infarction.

The following statistics have been taken from a recent article by Davenport.

TABLE 1

SEX DISTRIBUTION			
Male	.....	355 Cases	58.1%
Female	.....	257 Cases	41.9%
Total	.....	612 Cases	

The above figures are directly opposite to those of Earl who found 82.2% in females and 17.8% in males. However his series was much smaller, and the cases were all reported from a home for the aged, the occupants of which were chiefly women.

TABLE 2

AGE DISTRIBUTION					
"Aged"	4.4%	40's	.....	7.1%
80's	8.4%	30's	.....	3.6%
70's	28.4%	20's	.....	1.2%
60's	31.6%	10's	.....	1.2%
50's	13.4%	1-10	.....	.7%

TABLE 3

SURVIVAL					
"Sudden"	68.4%	1 to 12 Hours	.....	9.8%
Less Than 10 Minutes	9.2%	12 to 48 Hours	.....	4.4%
10 to 20 Minutes	2.8%	2 to 8 Days	.....	3.0%
20 Minutes to 1 Hour	1.1%	8 Days	.....	1.3%

TABLE 4

SITE OF RUPTURE					
Right Auricle	5.3%	Right Ventricle	10.7%
Left Auricle	1.8%	Left Ventricle	79.8%
Miscellaneous	2.4%

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TABLE 5

EXCITING CAUSES	
A. Condition of Coronaries Given	
Coronary Thrombosis Infarction	24.8%
Marked Coronary Disease with Various Myocardial Lesions	18.8%
Cause Not Determined—Coronaries Normal	1.7%
B. Coronaries Not Mentioned	
Cause Not Determined	12.3%
Heart Apparently Normal	0.9%
Fatty Degeneration and Infiltration	28.5%
Softening	6.4%
Thinned Wall Aneurysm	4.7%
Lues	0.9%
Abscess	0.3%
Tuberculosis	0.2%
Parasitic Cyst	0.3%
Tumor (Melanotic Sarcoma)	0.2%

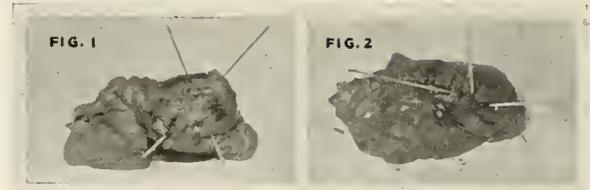
CASE REPORT

On May 24, 1932, I was called to see the patient Mr. B. H. B. age 69, whom relatives thought had had a stroke. When I arrived I found the patient lying out on the lawn dead. I had never seen the patient before for professional services, nor had he ever had any treatment by a local doctor. I am indebted to Dr. A. T. Baker of Minneapolis for kindly supplying me with the following past History: "I have known for the past 15 years that Mr. B. has had diabetes and have had him on a diabetic diet. About five years ago he was troubled with furunculosis which cleared up in the course of a few weeks.

"On May 11, 1932, he came to my office. He had lost a great deal of weight and looked badly. There was a great deal of sugar in the urine at this time. I talked to the daughter about bringing Mr. B. to the hospital and starting insulin, but on account of financial conditions, they were unable to do this. Blood pressure at this time was 180 systolic and 100 diastolic. His heart was apparently all right, and he made no complaint of pain in the chest.

"May 18, 1932, he again came to my office complaining of severe precordial pain. His pulse was 100 and respirations 18. Some dyspnea was present. I told his daughter again that he was a sick man and should be taken to the hospital. Medication was one-half grain of luminol every four hours. My diagnosis was diabetes and coronary disease."

Following his consultation with Dr. Baker, the patient returned to Fargo. The following history was obtained from the relatives. Mr. B. had not disclosed the findings of Dr. Baker so they did not suspect any serious condition. However, the patient had complained for the past four months of being short of breath, and always required the windows to be wide open. He also required several pil-



The wooden applicators have been inserted along the course of rupture. The middle applicator has been placed at the site of incomplete rupture.

lows for sleep. On the evening of the 23rd he retired feeling very well. He arose on the morning of his death, came down stairs, and after walking about complained of substernal pain and nausea. He vomited and it was passed off as an attack of indigestion. He kept up and about, and again at noon experienced nausea and vomiting, in the meantime the pain persisting as a dull substernal epigastric ache. At five P. M. when his son returned home, nothing unusual was noted except that the patient seemed quite restless. He still spoke of the pain but did not seem acutely ill. He then went outside on the lawn where a neighbor saw him fall. Permission for an autopsy was granted.

AUTOPSY

The autopsy was made within one-half hour of death. The body is that of a white obese male of apparent age. The body is still warm, rigor mortis and cyanosis are absent. There are no external bruises or abrasions, and there are no enlarged glands.

Eyes—Nothing abnormal noted.

Mouth—No froth. No contusions of tongue.

Panniculus—The superficial fat measures about four inches in thickness.

Lungs—There are a few adhesions at both bases and at the right apex. In the parenchyma of the right apex is an old healed calcified tubercle. Cross section of both lungs is normal. The pulmonary vessels are not remarkable.

Pericardium—The sac is of a blueish hue and distended with fluid. On opening the sac about 300 cc of bright unclotted blood gushed forth. There are no signs of a pericarditis.

Heart—There is a large amount of epicardial fat. On the anterior surface of the left ventricle about one-half inch above the apex is a narrow slit-like tear measuring about 1 cm. in length. Fresh blood oozes from this opening and a blunt probe passes freely through it into the cavity of the left ventricle. 1 cm. above this tear is another rent of about the same size and appearance. I was unable to pass any probe through this opening into the left ventricle. To the right

of these two tears and slightly toward the base of the heart is a raised darkened area in the myocardium, which extends over onto the surface of the right ventricle. This entire field is along the course of the anterior descending branch of the left coronary artery. The darkened elevated area was incised and probed, and again it was noted that the probe passed freely into the cavity of the left ventricle. This represents an incomplete rupture, the blood dissecting an irregular course through the myocardium. There was no attempt at walling off by the pericardium over this area. On opening the heart, all the valves appear quite normal. There was a surprisingly small amount of sclerosis of the aorta, much less than one would expect. The left coronary artery was dissected out. About two cm. from its origin a fresh thrombus was found which completely blocked the vessel. Distal to the fresh thrombus the vessel was completely blocked by a hard calcified process of long standing. This part extended well into the infarcted area. On the inside of the left ventricle just above the apex on the anterior wall was a fresh thrombus that came away piecemeal. Beneath this thrombus was an infarcted area roughly the size of a silver quarter. Rupture had occurred through this area. The papillary muscles for the mitral valve were attached to this portion of the ventricle. The remainder of the coronary vessels were closely examined, but there was no evidence at least grossly, of sclerosis. There was a moderate hypertrophy of the left ventricle, the wall being about three and a half cm. in thickness. At the site of the infarct the wall has lost its usual appearance, being replaced by soft mushy tissue. There is a marked hyperemia at this area also. The weight of the cleaned heart was 370 grams.

The clinical diagnosis was coronary occlusion. The anatomical diagnosis was, thrombosis of the anterior descending branch of the left coronary artery; infarction of the left ventricle with rupture; hemopericardium; and healed pulmonary tuberculosis.

Clinically the case is interesting in view of the fact that we have a patient walking around with very little discomfort in spite of the serious damage to his heart. This is not an uncommon finding. Diabetes of course pre-disposes to arteriosclerosis and the incidence of coronary accidents in diabetes is not at all uncommon.

Anatomically the case is interesting because it shows the rare condition of incomplete rupture. The fact that the sclerosis was limited to the anterior descending branch of the left

coronary artery is also of interest. There seems to be no question but that there was an old and recent process. One could imagine that the previous obstruction had caused a local area of infarction which had healed and was being supplied by collateral circulation. The new thrombus could readily shut off the collaterals producing a new extensive necrotic area, with subsequent rupture.

Since the case represents the terminal picture of coronary sclerosis it is fitting here to discuss briefly coronary thrombosis.

In a survey of the literature most of the investigators feel that there are no definite clinical symptoms of myocardial rupture. In most cases the termination is instantaneous. In those that do live for a few moments, pain, nausea, vomiting, air hunger, extreme shock, and finally unconsciousness are noted. In cases in which rupture was supposed to have occurred sometime before, one cannot be certain of the accuracy of the diagnosis as the symptoms fit very well into those of coronary thrombosis. The importance of the recognition of coronary thrombosis then becomes paramount in the treatment of myocardial rupture.

Coronary thrombosis is a sudden acute accident. It may be preceded by symptoms of angina or of exertion pain, but when the acute process occurs the patient usually realizes that some terrible thing has occurred. If the patient survives the initial shock, he will usually be found in shock, pale and clammy. The pain may be agonizing, crushing, heavy or dull. It is often substernal radiating into the neck or down the left arm. Very often it may be epigastric and this together with a rigid abdomen may suggest an acute abdomen. Not infrequently have diagnoses of ruptured ulcer, or gall stones been made and the patient operated, only to find no pathology. Later, often at autopsy the true diagnosis is made. Another characteristic of the pain is its resistance to the ordinary doses of morphine. One-half grain doses repeated every three or four hours may be required. This is usually quite the opposite of gall stone colic. The fact that nausea and vomiting are so often present, frequently leads to the diagnosis of acute indigestion, and in the past it was not uncommon to see death certificates signed "Acute Indigestion." There is no justification for such a diagnosis.

Shock is often outstanding. The patient may be pale, and in a cold sweat. The pulse

fast, weak and often irregular. In some cases if the process had involved the conduction system block may be present. The patient is usually very restless, thrashing about in bed or up walking around. Air hunger is quite marked. In fact a painless dyspnea may be the only indication of an acute closure. Early the temperature may be normal or sub-normal, but a frequent rectal reading should be made as there is most often a rise. This may amount to only one or two degrees but it is significant, and represents a constitutional reaction from the infarcted tissue. Leucocytosis is a frequent accompaniment, and is also a reaction due to protein absorption from the infarcted area. The leucocyte count varies from 11,000 to 20,000, the average being about 14,000. Frequent blood pressure readings should be made as there is commonly noted a fall in blood pressure. It is not rare to see a previous blood pressure reading of 190 before occlusion drop to 80 or 90 systolic. The electrocardiogram is usually diagnostic. The early high take off of the T wave, and the gradual conversion to an iso-electric or inverted T waves leaves no doubt as to the nature of the condition. However, the presence of pain, dyspnea, shock, friction rub, elevation of temperature, leucocytosis, and hypotension are enough to warrant the diagnosis.

Examination of the heart soon after death shows a thrombosed artery. The area supplied by this vessel is the site of the infarct. When seen early the area is represented by a reddened site, due to extravasation of blood between the muscle layers. Features due to this remain most marked for three or four days. A thrombus is often found attached to the infarcted area. Necrosis then follows in this area and is most marked from the fourth to the twenty-first day. It is during this time that the danger of rupture is greatest. It is also during this stage that liquifaction of the necrotic muscle takes place. Repair with connective tissue proiferation is of no consequence until after the third week.

The actual mechanism of tear and rupture have never been satisfactorily explained. In hearts containing infarctions, the factors which weaken the wall locally are softening and hemorrhage. The importance of softening is very great and is seen firstly at the time when softening is maximal, and secondly with excessive mural fat. Fat necrosis occurs almost to liquifaction, so that when infarction occurs

in such a heart, not only is the resistance to strain, either of muscular force or of hemorrhage greatly diminished, but any hemorrhage once initiated is practically led into the epicardium. Hemorrhage is an important factor. It is commonly accepted that the hemopericardium which is found in nearly all cases must come from the ventricle, but closer examination renders this less certain. Hemopericardium occurs in cases of partial rupture where there is no communication with the ventricle, or even in cases of hemorrhagic infarction in which there is no visible evidence of rupture of any kind. In such cases the blood must come from the heart wall, and such a hemorrhage may not only be a result, but sometimes the main factor in causation of cardiac rupture. Such hemorrhage commonly occurs as capillary hemorrhage from the hyperemic area at the edge of a recent infarct, and is responsible from the "apoplectic" infarcts which are not infrequently seen. Indeed all infarcts pass through a hemorrhagic stage, the intensity of which must vary with such factors as the degree of softening and the time of its occurrence. From gross apoplectic infarction to actual rupture of the heart is a short step, especially in the presence of semi-liquid necrotic fat.

The part played by the infarcted muscle is important. It is plain that in the infarcted area the muscle is dead and inactive. Now, the part played by the surrounding active muscle on the infarcted area is very important, and much light is thrown upon it by the appearance of the internal opening of the rupture. In the majority of the cases this is placed either at the base of a papillary muscle or at the junction of the septum and the outer heart wall, both points subjected to the stress of divergent action of the two main muscle masses.

The mechanism of death is not clearly understood. Quite obviously the myocardial tear in itself is not fatal, and theoretically death should occur from obstruction of the great veins by the increased intrapericardial pressure. In some cases there is little blood in the pericardium, whilst the sudden death suggests ventricular fibrillation, or syncope as seen in Stokes-Adams syndrome. The danger of hemopericardium depends chiefly on the rapidity with which it forms. That sudden death can occur from sudden obstruction of the great veins is shown by a case in

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The Differential Diagnosis and Treatment of Pyelonephritis

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PYELONEPHRITIS is one of the most common of all urologic conditions which not alone the urologist and the general practitioner encounter, but men doing work in any and all branches of medicine. In the majority of instances the general practitioner is first consulted by these patients for relief. However, this condition is very frequently a serious problem when it presents itself as a complication to the Surgeon, Diagnostician, and to the Pediatrician, while the Obstetrician is often confronted with this condition as a complication of pregnancy which requires painstaking care and conservative management.

In a recent article Stirling states that around 50 per cent of the cases of pyelonephritis are erroneously diagnosed due to the improper evaluation of urinary findings, and that many of these patients are treated as appendicitis, cholecystitis, and duodenal ulcers. Acute pyelonephritis is frequently confused post-operatively with influenza, salpingitis, and diaphragmatic pleurisy. My objective in this brief communication is to emphasize the important points in the differential diagnosis and treatment of this common condition.

ETIOLOGY AND PREDISPOSING CAUSES

Pyelonephritis is an inflammation of the kidney, kidney pelvis, and ureter usually accompanied by a cystitis. It may be acute, sub-acute or chronic. This name is generally favored over pyelitis and cystopyelitis because it more closely describes the pathologic findings. Strictly speaking, pyelitis represents a very acute form probably in the early stage and is seldom seen; as an inflammation of the kidney pelvis alone rarely occurs. (Mathé). The disease attacks patients of all ages although it is most common in middle life, Kretschmer stating 25 per cent of his cases presented themselves during the fourth decade of life.

The predisposing causes of this condition are: constipation, with concomitant hemorrhoids, anal fissures and fistulae; foci of infection, chiefly prostate and seminal vesicular in the male, cervix and adnexa, gall bladder, upper respiratory and dental infections. Pathology in the urinary tract itself predisposes the kidneys to infection;

any condition which causes an interference with urinary drainage either in the upper or lower tract. In the lower tract enlargements of the prostate gland, prostatic bar and urthral stricture are the most common. In the upper tract, pyelectasis or ureterectasis caused by calculus, ureteral stricture, hydronephrosis and pyonephrosis, predisposes to a kidney infection. These cases are not true instances of pyelonephritis, but are to be considered as infections secondary to primary pathology.

The role of focal infection as a precursor of acute and chronic pyelonephritis has been known for many years. Foci in the upper respiratory passages and the teeth are the most important of these. Gastro-intestinal lesions and intestinal stasis are found in about 33 per cent of all cases. Cultural bacteriological studies commonly show the colon bacillus to be the predominating organism but it is questionable whether or not this organism is a secondary invader; however, there are unquestionably cases in which the colon bacillus is the causative organism. Repeated cultural studies are often necessary in order that the true infectious cause may be determined, and when this is done the streptococcus will commonly be found to be the primary cause while the colon bacillus is a secondary invader. The experimental work of Bumpus and Meiser reported in 1921 has proved that certain types of streptococci recovered from infectious foci have a selective affinity for the urinary tract.

The possible routes of infection have given rise to much speculation on the part of urologists and pathologists, but the route of invasion whether it be hematogenous, by means of the lymph channels, or of the ascending type produces the same pathologic picture in the kidney. However, one is safe in stating that the majority of these cases are of hematogenous origin.

TYPES

Kretschmer has divided pyelonephritis into the following clinical types:

Simple pyelonephritis, usually encountered following some acute infection, upper respiratory in origin or metastatic from single or multiple foci.

Pyelonephritis of infancy following the acute infectious diseases.

Pyelonephritis of matrimony which may be the result of the introduction of infection per vaginum or may follow minor tears in the hymen or vaginal mucous membrane. This is commonly of the colon bacillus type.

Pyelonephritis following surgery of the rectum, vagina, or pelvic viscera.

Pyelonephritis of pregnancy.

DIAGNOSIS

The diagnosis of this condition depends upon a careful urinalysis. In the more acute types the history of pain in the kidney region, urinary symptoms, malaise, together with fever are of importance. The differential diagnosis consists of the ruling out of co-existing urinary tract pathology by means of cystoscopic data and urographic findings. Instrumental examination of the urinary tract is not undertaken during the febrile stages of an attack. Cultural studies on the bladder urine as well as that obtained by means of the ureter catheter are made in an effort to establish the causative organism. Tuberculosis must be carefully and painstakingly ruled out in the same manner. Gonococcal pyelonephritis is an infrequent complication of posterior infections in the male but must be considered and ruled out in all patients presenting themselves during an attack of acute or chronic posterior gonorrhoeal urethritis. Repeated bacteriological studies are often necessary before this can be accomplished.

The differentiation between pyelonephritis and certain types of glomerular nephritis is usually not difficult. In general there is usually less albumin present than in nephritis, not many hyaline casts, while cellular casts are more numerous. Leucocytes and red blood cells may be present in abundance in both conditions.

TREATMENT

After the diagnosis of pyelonephritis is established, treatment should be thoroughly undertaken. Early and persistent treatment are the methods by which we will be able to restore most of these patients to health and shorten the period of morbidity. In a recent work of Braasch, he emphasizes the fact that thorough treatment is usually undertaken late in the course of the disease after much destruction of kidney substance and cicatricial changes in the calyces, kidney pelvis and ureter have taken place. The delay in early and thorough treatment as well as the overlooking of foci of infection have been responsible for the poor prognosis in chronic pyelonephritis. In general, the prognosis depends upon the duration of the infection, the virulence

of the infecting organism, and the patient's general resistance.

In the the treatment of acute and transitory attacks of pyelonephritis internal medication of various types is usually sufficient, and is all that is used during the febrile period, alkalinization and acidification of the urine together with hexamethylenamine and other urinary antiseptics is employed at this stage. Recently many newer drugs have been brought forth; dyes such as pyridium, mercurochrome, and neutral acriflavine, as well as drugs of the hexylrescorcinol type. Intravenous use of hexamethylenamine, mercurochrome and neosarsphenamine have their definite uses when indicated, especially in the febrile stages of the disease. Copious amounts of fluids should be given and the total fluid intake and output should be accurately measured daily. Appropriate measures should be used to control the patient's pain.

In a recent work by Clark of the Mayo Clinic, he has successfully treated several male patients suffering from long standing pyelonephritis, cystitis and prostatitis, by means of the quantitative ketogenic diet. He concluded that the by-products of ketosis plus the alteration of the P H of the urine were factors in the rendering of bactericidal urine. Helmholtz has observed similar results in treating infants with pyuria. My experiences with the ketogenic diet have been most encouraging but much further work must be done in order that its true value may be established.

The eradication of all foci of infection is of the utmost importance in the treatment of pyelonephritis especially in its chronic form. Intestinal stasis and constipation should be corrected. All foci, such as abscesses should be drained surgically. Respiratory infections should be treated medically and such foci as tonsils and the para-nasal sinuses should be cleared up by whatever means necessary. In the male, the prostatic and seminal vesicular foci should be treated vigorously, while in the female such foci as the uterine tubes and cervical glands are to be removed. All abscessed and devitalized teeth must be removed.

In all patients not responding to conservative medical treatment after a reasonable period of time has elapsed the employment of in-lying ureter catheter drainage is the treatment of choice. This may be carried out by means of intermittent catheterization and lavage, the frequency of which will be governed by the progress of the patient; or by permitting the ureter catheter to

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Phrenicectomy*

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THE phrenic nerve arises chiefly from the fourth cervicle nerve, with a few filaments from the third and a communicating branch from the fifth cervicle nerve. It sends sensory filaments to the central and posterior parts of the diaphragm, which spread out on both surfaces; the periferal portion of the diaphragm gets its sensory supply from the intercostals.

The phrenic nerve descends to the root of the neck, running obliquely across the front of the scalenius anticus muscle, passes over the first part of the sub-clavian artery, between it and the sub-clavian vein, and, as it enters the chest, crosses the internal mammary artery near its origin. Within the chest it descends nearly vertically in front of the root of the lung and by the side of the pericardium, between it and the mediastinal portion of the pleura, to the diaphragm, where it divides into many branches, which separately pierce that muscle and are distributed to its under surface.

The two phrenic nerves differ in their lengths, and also in their relations in the upper part of the thorax, but their course from their origin in the deep branches of the cervicle plexus down to the root of the neck is fairly constant in both sides.

Besides their enervation of the musculature of the diaphragm, each nerve supplies filaments to the pericardium and the pleura, and each is joined by a filament from the sympathetic, and occasionally by one from the union of the descending hypoglossi with the spinal nerves; but this is found usually on the left side. Branches also occasionally pass to the peritoneum, and the phrenic is connected in the abdomen with the caelic plexus.

Lines of cleavage in the skin are always important to the surgeon, especially if the incision to be made is one which shall later leave a scar in some exposed area. Therefore, the incision in phrenicectomy, either right or left side, should be made along the lines of cleavage. While there are those who advocate a small incision along the outer border of the sterno-mastoid muscle, it is our procedure under novocain infiltration, to incise transversely just above the sub-clavian artery and vein, about 3 c.m. above the clavicle and parallel with it, the incision being about 5 c.m. long, half over the posterior border of the sterno-

mastoid, and proceeding backwards. This allows the use of small spring retractors for the superficial tissues, and exposes the sub-clavian triangle very readily. A blunt hook retractor then draws the posterior border of the sterno-mastoid muscle forward, fascia is cleared away, exposing the salenius anticus muscle, with the phrenic nerve running across the front of this muscle. Care must be taken not to cut the transverse cervicle which often crosses the anterior scalenius. It is important to remember that as a rule the phrenic nerve is under the anterior belly of the omohyoid muscle, passes under the transverse cervicle artery and vein, and that the sub-clavian artery lies beneath the anterior scalenius muscle while the sub-clavian vein lies anterior to the muscle, and proximal to its corresponding artery. Thus the phrenic nerve passes over the sub-clavian artery and under the sub-clavian vein. A means of further identifying the nerve is to exert slight tension on it and determine if pain is felt in the corresponding shoulder area. Pinching of the nerve also causes dilatation of the corresponding pupil.

A small amount of novocain solution is first injected directly into the nerve trunk just as it emerges under the omohyoid muscle. Manipulation of the nerve can then be carried out below this point without any distress, as hiccoughs, to the patient.

Two general classifications can be made of this operation, either a temporary or a permanent blocking of conduction through the nerve.

Conduction may be temporarily interrupted by

(a) Simple freezing with ethyl chloride, with functionally return in from 7 to 10 days.¹

(b) Simple resection with immediate suture, with functional return in about 4 months.²

(c) Alcoholic injection with functional return in 3 or 4 months.³

(d) Crushing of the exposed nerve, with functional return in about 6 months. This is probably the most common method used for temporary diaphragmatic stasis. Its use is being rather abandoned and permanent paralysis of the diaphragm being most sought for. O'Brien⁴ states that it is necessary in 90 per cent of cases in which nerve crushing has been performed to subsequently do a phrenic exeresis.

*Delivered at Mineral Springs Sanatorium, August 25, 1932.

Permanent interruption of conduction is obtained by the removal of a distinct portion of the phrenic nerve. After the nerve has been severed between small hemostats, the distal portion is steadily drawn upwards by rotary traction, and the entire nerve may slip out of its sheath and be removed. There is some objection raised to attempt the removal of the nerve. The pericardial-phrenic artery which accompanies the nerve and the venae comites in the same sheath, has been on a few occasions ruptured, with fatal termination, when the lower segments of the phrenic nerve have been twisted away from the nerve sheath. More frequently however the nerve will separate and only a portion of it can be removed. It is generally conceded that at least 10 c.m. must be removed in order to sever the main trunk from its accessory branches and thus allow a permanent diaphragmatic paralysis. Following the procedure advocated by the Veteran's Bureau, we also inject a small amount of alcohol directly into the phrenic nerve just proximal to the point where it is held by the small hemostat. This seems definitely to lessen the incidence of small neuromata developing in the proximal end. The wound is closed without drainage.

Following operation, there may be some limited temporary general distress, evidenced by increased coughing and expectoration, or abdominal distress of nausea and occasionally diarrhea. Operation on the left side, probably because of altered pressure conditions, seems to predispose to the gastric symptoms more frequently than if operation is on the right side. Almost invariably all the symptoms are transient in nature, though Roesler,⁵ in a limited study, reports of permanent cardio-gastric phenomena after phrenic exeresis on the left side. Operative dangers are minimum. There have been cases reported of reflex cardiac and respiratory disturbances with death, probably due to interference with the vagus and/or intercostal nerves. Berry⁶ after reviewing 4697 cases during a five years period, found it was detrimental in 56 cases, (1.2 per cent) and that death occurred in 26 cases, (.5 per cent). A few of these deaths are recorded as being due to air embolism; one to rupture of the mammary artery in the avulsion of the nerve; a few to severance, through error, of either the vagus nerve or the thoracic duct. I think that the operation can be considered as without danger when properly performed and in cases in which it is indicated.

Phrenicectomy however should be considered

only as palliative surgery. It has definite indications for relief of symptoms; it has likewise definite contra-indications, like any operative surgery in pulmonary disease, as (a) pneumonic tuberculosis, (b) cardio-vascular deficiencies, (c) bilaterally progressive processes and (d) extreme youth or old age. Its greatest field of usefulness is undoubtedly in the surgical treatment of unilateral pulmonary tuberculosis in those cases where, even with and after routine sanatorium treatment, further measures must be instituted to compress the diseased lung and put it at rest to facilitate its healing.

While the operation itself has been recorded in medical literature for nearly 20 years, following Sauerbruck's⁷ and Stuertz's⁸ first studies. I do not feel that it has been as readily accepted as those who have interested themselves in this subject could wish. On the other hand I am aware that the surgeon is more apt to become an enthusiast for some surgical procedure in which he is interested than the man in any other branch of healing. Further outside of institutional work, where a large number of selected types of cases are gathered, the average surgeon does not have a very great opportunity to see any number of cases in which phrenicectomy is indicated.

Over a period of four years, we have had occasion to do this operation 36 times.

Bronchiectasis	1
Persistent hiccough	1
Acute hemorrhage	1
Pericardial adhesions with pleurisy	1
Pneumothorax cases	6
Thorocoplasty (preliminary)	5
Chronic empyema with cavity	3
Unilateral (clinically) tbc.	18

The majority of these cases which we have seen have been in war veterans, who following months or even years of sanatorium treatment, have returned to their homes and either will not or cannot take proper care of themselves, and continue in that stage of health which shows no change for the better. I firmly believe that in these cases the paralysis of the diaphragm on the affected side is definitely indicated, and I have seen these men definitely improve, in the majority of cases.

In our last five thorocoplasties we have done phrenicectomy as a preliminary operation. I know there is some controversy relative to this procedure; and yet unquestionably it is true that it is a means of determining whether or not we will have a flare-up in the better lung following

thorocoplasty. We have all seen violent flaring up of the lung not compressed by the thorocoplasty following that operation. It is equally true that there have been flare ups of the better lung following phrenicectomy,⁹ but I feel that it is safe to assume that these cases would have reacted similarly if the thorocoplasty had been done as the first operation, and the phrenicectomy done later or not at all. Another point to be considered also is that I am sure there are cases in which the phrenicectomy has given sufficient improvement to render more extensive surgery needless. Our cases were cases of long existing infection, during which time there had been some compensating action on the least affected side, which may account for the fact that we had no untoward results. We have also done in several instances, phrenicectomy in cases where artificial pneumothorax had been used on successive instances, and where these men preferred to submit to phrenicectomy in the hope that "refills" would be lessened: a hope which was borne out in every one of these cases. In this type of cases again I feel that we have a definite indication of operative support.

In the other cases in this very limited series, we do not draw any deduction from them but point out some interesting facts. A case of acute hemorrhage in a young man who had just prior to this returned from 6 months of sanatorium treatment with a right lung infection, was checked by the compression of the lung following avulsion of the phrenic nerve. A case of persistent hiccoughs, associated with a liver abscess, of 12 days duration, was checked by a bilateral phrenicectomy, after all other methods had failed. Unfortunately the woman died eight days following the operation, so we have no conclusions to draw from our only bilateral phrenicectomy. The bronchiectasis case was a distinct failure; I think now it should not have been done; marked effusion occurred followed by empyema, with a rib resection and drainage being necessary. The case of pericardial adhesions with left friction rub was definitely benefited by great lessening of pain. In the three cases of chronic empyema with cavity, all from shrapnel wounds, there was a definite obliteration of the cavity in one case and diminution of its size in the other two cases, following phrenicectomy.

This obliteration of persistent cavities is a striking feature. There are numerous case reports in the literature on the disappearance of cavities, born out by roentgen plates, following phrenic exeresis. Although the percentage is not

as high as with the successful administration of artificial pneumothorax, yet the simplicity of the operation, and its marked limitation of possible complications, lead one to consider if it should not be used almost routinely in place of pneumothorax with its longer time element and its greater dangers of complication, especially pleural effusion, which has been estimated as occurring in from 30 to 70 per cent of all cases following artificial pneumothorax.^{10 11} O'Brien¹² reporting 500 phrenicectomy, in which series there were 378 cases with cavity, reports 191, or 50.5 per cent of these cases, having cavities closed following operation, while an additional 119 cases, or 31.2 per cent, the cavities became smaller following operation; or is a total of 82.85 in which there was favorable influence exerted in existing cavity formation. Berad and Guilleminet¹³ report cavities in apices as large as oranges becoming obliterated following phrenicectomy and report these cases as cured after as long as 4 or 5 years. Matz¹⁴ in his series of 100 cases and Cooper¹⁵ in his report of 103 cases, state respectively that 27 and 38 contractions of cavities occurred, though the percentage of cases with cavities is not given.

The location of the cavity formation is a matter of some controversy as to the results expected. Cooper¹⁶ reporting on 300 cases of phrenicectomy done at the Fitzsimmons General Hospital, is of the opinion that cavities near the base or in the mid lung are more benefited by phrenic exeresis, though others^{19 20} report that apical lesions are as favorably acted upon. Personally I can never see any special reason for becoming unduly concerned over cavity formation; it is not the loss of the lung tissue but the toxic absorption that is the important factor as I see it. I think we are justified in sacrificing lung tissue, as by lung compression in phrenicectomy if we can thereby eliminate toxemia.

Adhesions of the lung, interfering with proper collapse at pneumothorax, offer another type of case which I consider favorable to phrenic exeresis, except in those cases where the diaphragm is fixed by inflammatory process, and in which, according to Head,^{21a} the lower thoracic wall is mobilized and movement of the lung favored by phrenicectomy. I think that it is a debatable question, however, in spite of those^{3 17 33 34} who advocate the operation complementary to all pneumothorax cases, whether it should be adopted routinely. The argument advanced that not so much air is needed and therefore the time between injections is length-

ened is correct,¹⁸ as it has been definitely shown that there is a difference of five c. m. of water on intrapleural pressure following paralysis of the hemi-diaphragm^{21 22} and that the chest capacity on the side on which the phrenic exeresis has been performed is reduced from one-sixth to one-third, or a comparative compression of the lung equal to the intraduction of from 400 to 800 c. c. of air into the pleural cavity.²³ But to further compress an already compressed lung may sometimes precipitate a catastrophe, as in O'Brien's case¹² where only the hurried removal of the air saved the patient. I think it would be a safer procedure to do a phrenicectomy as a supplementary procedure to pneumothorax only when the pneumothorax has not been successful, and in those cases where repeated injections have become necessary. The contention made by many that if a pneumothorax is indicated at all, the same indications warrant doing a phrenicectomy, and that in case it is decided later to allow the compressed lung to re-expand it is not necessary to reinflate to fill the original full sized chest cavity, has merit to its contention. Certainly the chances for opening up a healed cavity are lessened; but if it again becomes active, was it ever a "healed cavity?" But consider that phrenicectomy produces primarily an immobilization; artificial pneumothorax produces primarily a collapse, and immobilization and collapse are not synonymous terms. While the question fascinates me, I cannot concede doing a supplementary phrenic exeresis to all pneumothorax cases, nor substituting phrenic exeresis for all pneumothorax therapy.

But I do think the operation has established for itself a definite place in the treatment of tuberculosis and other pulmonary conditions. Do we actually put a lung to rest by confining the patient to bed? A normal living individual raises and lowers the diaphragm 24,000 times a single day—certainly not a restful state for the adjacent lung tissue! If the splinting of the diaphragm will help decrease this motility certainly it has some indications in the treatment of pulmonary disease, if we concede that rest is of benefit at all.

Results are fairly satisfactory in cases so far reported. Originally it was feared that complete and permanent paralysis of the diaphragm might give rise to a considerable eventration of the upper abdominal viscera, and there might arise a marked atrophy of diaphragm leaving a weakened and thinned shelf, and the possibility of diaphragmatic hernia. But careful observation over a period of years has shown that no marked even-

tration takes place, nor can I find any report of diaphragmatic hernia following phrenicectomy.

That there is a rise in the diaphragm is of course well known. Only rarely after exeresis will there be no elevation²⁴ and even in cases where there was no rise, fixation of the diaphragm was the rule.²⁵ The diaphragmatic rise is noted immediately following the nerve paralysis and is at first about three c. m. Then as complete atrophy occurs, unusually in about four to six months, the rise may extend upwards seven or eight c. m.'s, unless there are extensive diaphragmatic adhesions present. This rise is produced more by the intra-abdominal pressure than by the negative intra-thoracic pressure. It is generally conceded that the higher the rise the more favorable the results to be expected, though this cannot be set down as a fast rule.

It is extremely interesting to watch the movements of both the lung and chest by means of fluoroscopy following phrenicectomy. In the normal individual we have both a vertical and horizontal movement on inspiration, with the normal tendency to draw the entire lung towards the bronchial tree, and the reverse motion in all these planes on expiration. But in the case where we are dealing with a paralyzed hemidiaphragm, the vertical movement in the mid-lung in the vertical plane is distinctly limited, and we find no motion vertically in the base of the lung, except occasionally, and I think that in these cases it is caused by adhesions being present, we have an upward motion, on inspiration, of the base of the lung. The lung motion in the horizontal plane does not show marked change except the movement towards the medial line is more pronounced following phrenicectomy, no doubt due to the mediastinal excursion from diaphragmic action on the side of the unaffected hemidiaphragm.

The effect of posture, and the scope of postural rest following phrenicectomy has been studied by Fisher²⁶ who includes in his study a rather detailed description of diaphragmatic movements, especially on the sound side, and whose conclusions are that following phrenicectomy the scope of postural rest is widened, especially for patients with unilateral involvement, or with only aical disease in the contralateral lung. He also maintains, due to the greater displacement of heart and mediastinum, postural rest on the better side following phrenicectomy is inadvisable. Further studies in diaphragm movement following phrenicectomy has been made by Iselin,²⁷ reporting on bilateral phrenicectomies and who therefore is

(Continued on Page 163)

A Consideration of the Etiology, Course and Treatment of Anal Pruritus*

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ANY condition so intolerable to the patient that suicide seems preferable warrants serious attention from the medical profession. Anal pruritus, if advanced far enough in its course, is always devastating in its effects on the patient. He cannot sleep, he is embarrassed by the urge to scratch himself continuously in public, he soon suffers from a profound nervous exhaustion and is marked as a neurasthenic by anyone examining him. Tuttle states that anal pruritus is a symptom rather than a disease entity but this consolation only serves to increase the feeling of hopelessness in the patient when he is told that there is no evidence just what disease the pruritus indicates in his case.

Observers in the past have felt that any number of local anal pathological conditions were of etiological significance. Hypertrophied anal papillae were removed as the cause of anal pruritus for some time as were internal hemorrhoids, fistulas, anal fissures and external varicosities. To this day itching and hemorrhoids are associated in the minds of many men; "itching piles" is an oft heard expression based on this assumption.

In addition to these local anal conditions there is a vast array of other diseases which have been credited with being the causative factor in specific cases cited in the literature on this subject. Diabetes was thought to cause the pruritus by raising the sugar content of the tissue fluids to a concentration where the nerve endings were irritated; rectal malignancies have often been cited as the etiological agent. Tuttle, in his text says, "Patients predisposed to muscular rheumatism and arthritis are very frequently the victims of anal pruritus." Diseases of the liver and gallbladder are often associated with this affliction. So many etiological agents have come under consideration that Buie, in his monograph on *The Treatment of Hemorrhoids and Anal Pruritus*, found it convenient to classify the cases as direct and indirect, depending on whether the cause of the pruritus was considered to be existing within the tissues of the pruritic zone

or occurring at some point in the body distant to the itching area.

Probably Montague has done more in directing thought on this subject than any other writer. In his book entitled, "Pruritus of the Perineum," he has brought out a very convincing interpretation of the mechanism through which perineal pruritus occurs. In discussing indirect pruritus he mentions a long list of affections which have been reported as occurring in conjunction with anal pruritus and points out that the general factor common to all these cases is pathology in one of the visceral organs of such a nature that the affected viscus is increased in size or tension. I am quoting from his work as follows: "Whenever a viscus is the seat of chronic inflammation, congestion, hyperplasia, hypertrophy, distention or dilatation, a stream of afferent stimuli is generated by the mechanical tension on the Neural arborizations terminating in its capsule and such stimuli are transmitted by the afferent visceral nerves to the central nervous system. These viscera, however, are supplied by fibers of the autonomic nervous system and these fibers are not able to convey painful stimuli. Langley and Gaskell have, however, proven that the afferent nerves from the viscera come into synaptic relation with the somatic fibers in the ganglia of the posterior nerve roots and in the lateral horn of the spinal cord. These abnormal afferent impulses from the viscera lead to stimulation of the somatic by creating an irritable focus in the posterior root spinal ganglion, and the function or sensation being more highly developed in reference to the somatic afferent, the irritable focus is referred in consciousness, not to its true source, but to the place from which such stimuli are habitually received, and hence, the irritation is referred to the skin of the pruritic zone. This is a transference of sensation which is exactly analagous in principle to the misreference of pain, but that it is not a true reflex must be evident by an examination of the anatomical facts. You may question why such a transference of sensation is not evidenced as pain. It must be recalled that pain, like other sensations, has a definite threshold. The irritative stimulus which produces the transferred sensation of pruritus is below that threshold, and

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hence, is appreciated only as an irritation to which we have given the name of pruritus."

This explanation offers to my mind the most lucid theory by which one can connect up the multiple agencies known to occur in conjunction with anal pruritus.

Montgomery, writing on the pathology of this disease in the monograph edited by Buie, says there seems to be some evidence of analogy between anal pruritus and urticaria, anal pruritus showing the microscopical vascular changes present in urticaria. Typical attacks brought on by idiosyncrasy to various foods would tend to support this observation. Buie cites a case in his experience where, "An acute attack of itching followed an overdose of one of the popular pollen preparations now being injected hypodermically in the treatment of hay fever."

I have seen cases where exacerbations of the disease have been precipitated by emotional upsets. One patient whom I have seen suffers an attack of perianal itching each time she goes to church, while another patient told me he is sure to incur an attack whenever he undergoes an examination in his studies at school. These patients both had well defined anal pruritus which was thrown into an exacerbation by the emotional factors cited. The relationship existing between anal pruritus and the nervous system is not at all clear. A variable degree of nervous exhaustion accompanies any marked case of this disease but Buie cautions against assuming that the pruritus results from the nervous exhaustion, nerve strain or worry. He quotes Montague in saying, "The absence of pruritus ani in any great proportion among the insane is noteworthy and the rareness with which it is associated with hysteria or other recognized neurosis speaks very emphatically against the psychic theory in the matter of causation." Occasionally a cure will follow the detection and removal of some focus or irritability or infection. From this standpoint it is evident that it is always advisable to perform a thorough physical examination with the idea of ascertaining the presence of any focal infection. The removal of infected appendices and pathological gallbladders has been rewarded at times by the disappearance of the pruritus ani.

CLINICAL COURSE

Pruritus ani is as variable in its course as it is in its etiology. Certain factors such as exercise, with the resulting increase in perspiration and circulation seem to excite the itching. Frequently the warmth brought on in the body by draw-

ing the bedclothes over one in preparation for the night's sleep will bring on a long period of itching.

Early in its course the distress is likely to be intermittent with periods lasting several weeks or months between attacks. Eventually, however, the remissions become more infrequent and reluctant as he may be to do so the patient will consult his physician for the relief which his simple home remedies and patent medicines have failed to give him.

Rarely an acute form may be seen which is intense from its onset thruout its course. Occasionally cases of pruritus ani have been known to clear up spontaneously, but the big majority of cases will become gradually more severe over a period of several years following an insidious onset. No change in the symptomatology occurs to make the patient aware of the transition into a frank kraurosis ani.

The Gross Pathology of Pruritus Ani—This varies necessarily, with the severity of the case. In the early cases there may be no gross variation from a normal appearance. In a well advanced case, however, the deformity may be split up into that part due to the disease, per se, and that part inflicted by the patient traumatising himself in an effort to obtain relief from the itching or while asleep. Many gouges or scratches with bleeding may be seen from the traumatization.

The skin is effected in a rather elliptical shaped area about the anus, the skin posterior to the tip of the coccyx and anteriorly over the perineum to the vulval opening or the scrotum, being involved more than the area lateral to the anus. The skin seems to be thickened and presents an appearance not unlike that seen on a varnished surface when hot water has stood on it; This whitish appearance is due to a decrease in the pigmentation of the involved skin. The hair line is moved outside the pruritic area which usually runs an inch and one half to two inches lateral to the anus. There is an increase in the number and depth of the skin folds radiating away from the anus, and the skin may assume a soggy lichenified appearance. A certain foul smelling rather oily secretion exudes from the involved skin, which may have something of the appearance of a weeping eczema, although there is no vesiculation. The skin is at times, extremely hypersensitive in the fulminating cases or the severe chronic cases, a wisp of cotton causing the peculiar itching and painful distress when touched to this area. The sphincter muscle is usually somewhat hypertonic.

Microscopic Pathological Skin Changes—Considerable work in the histologic changes present in this condition has been done by Montague and Montgomery and while all their observations do not coincide, in the main they find similar structural changes. It is difficult to show some of the transitory changes in sections and Montgomery made an effort to preserve vascular states such as vasodilatation by putting his sections immediately into boiling formalin and makes the observation from such sections that pruritus ani shows histological changes very similar to urticaria.

There may be, in occasional early cases, no pathology present even though the symptoms are intense. In the older cases, however, there are definite and consistent changes present. There is hyperkeratosis with some edema of the superficial layers of the cutis and a proliferation of the stratum mucosum consisting of lengthening and narrowing of the papillae. Connective tissue hyperplasia occurs intensively in the corium. Montague finds a layer of sclerosed connective tissue around each of the structures in the corium in certain of his cases studied, as well as a diffuse infiltration of P. M. N. leucocytes in the cases where there has been a secondary traumatic dermatitis superimposed on the pruritus ani. A Meissner tactile corpuscle is shown in one of his microphotographs surrounded by cellular infiltration. Deposits of melanin may be seen in the stratum granulosum and mucosum.

In those cases where bacterial invasion has superimposed the element of infection, we see some loss of continuity of the epidermis. There is marked hyperkeratosis or non-desquamation of the epithelial cells plus a hyperplasia of the rete cells and edema of the corium forming the sub-epithelial tissue. Montgomery, quoted by Buie, states that there are no changes to be found in the cutaneous nerves, even in the older cases. There is marked dilatation of the lymph spaces and at times a vasodilatation. The whole process may be characterized as an exudative dermatitis and in the event that atrophic changes occur a kraurosis ani may be the end result.

COMPLICATIONS

Pruritus ani is subject to but few complications if we eliminate the constitutional nervous changes which are so common that they should be considered part of the picture of anal pruritus. Local complications consist of pyogenic and traumatic dermatitis and in a small percentage of cases malignancy may occur on the base of an old pruritus ani, in which there has taken place

the changes described as occurring in kraurosis ani. Those malignancies which I have observed associated with anal pruritus have been epitheliomata and always relatively malignant.

TREATMENT

A statement taken from patients exhibiting the indirect type of pruritus ani or pruritus essentialis as it was termed by Tuttle, will reveal the fact that local and constitutional measures of an impressive number have been used in the treatment of this disease. In early cases and those in which the exacerbation is not too severe, simple cleansing of the perineum and perianal skin after each stool with pure witch hazel, will afford a certain amount of relief. Depositing a pad of gauze, wet with witch hazel, between the buttocks and against the perineum while the patient is asleep will afford some additional relief. Often times when the traumatic changes are pronounced it will be advantageous to apply one of the anesthetic powders such as anesthesin, to the involved skin and rub it into the folds and sulci with some non-irritating liquid antiseptic such as metaphen or hexyresorcinol. Doing this daily in conjunction with the cleansing after each movement of the bowels will give a sufficient amount of relief to those whom it does not seem advisable to submit to more radical treatment; if the patient is seen relatively early in the course of the disease several years may elapse before he either must have more drastic treatment or the pruritus leaves.

This leaves a certain number of the severe cases where no definite cause may be demonstrated to whom it is imperative that relief be given by whatever means available. Experience has shown that such measures as chemical cautery, actual cautery, under-cutting operations, exposures to Roentgen rays and ionization of the pruritic zone with one of the heavy metals are each open to the criticism of being ineffective or causing deformities which are frequently as serious as the disease for which they are offered. I dare say every proctologist has seen such cases treated by X-ray and later exhibiting chronic atrophic ulcers and Roentgen dermatitis in the exposed area, some of which go on to malignant degeneration eventually. Stricture formation following the use of actual cautery or the chemical cautery is relatively frequent. Under-cutting operations designed to destroy the sensory nerve supply to the pruritic zone afford relief for about six months as a rule, at which time reunion of the severed nerve fibers has occurred and the intolerable situation from which they thought

themselves relieved will again start troubling them. The use of Benacol and hydrochloric acid infiltrations I have never seen rewarded with any success. Remaining for our use are two different applications of the same method which, stated simply, consists of subcutaneous infiltration of the pruritic area with about a forty to ninety-five per cent ethyl alcohol. We are all familiar with the effect of ethyl alcohol on myelinated nerve fibers but it remained for Stone to adapt this effect on nerve tissue to a useful end in treating anal pruritus. Buie, working at the Mayo Clinic, has elaborated the original technique used by Stone to its present point and over the period of about five years this method has been in use he has treated a sufficient number of cases to make his statistical reports, as published in his monograph, of value to other men who may contemplate the use of this form of treatment.

METHODS OF USING ETHYL ALCOHOL IN TREATING ANAL PRURITUS

1. For use in individuals where the skin folds are not too deep and the amount of secondary infection not too extensive, I have found that what may be termed the multiple puncture method offers good results. This method is applicable for individuals who do not wish to or cannot be hospitalized and may even be adapted to office administration, provided there is no surgery necessary within the anal canal or rectum.

Under a light gas or ethylene anesthesia and preparation of the skin as for any surgery in this area a small syringe of ninety-five per cent alcohol with a short fine gauge skin needle attached, the injection of the involved skin is begun. The alcohol is deposited under the skin rather than within the skin layers and at points about one centimeter apart from the outer margin of involvement up to the line of junction between the skin and mucous membrane of the anal canal; from two up to about five minims is injected at each puncture point. It is well to avoid the use of much force in making the injection so that the subcutaneous structures will not be too extensively involved by the alcohol. The pruritic zone has thus been injected in a stippled fashion with the injection points close enough together to permit the alcohol in each area to merge with that in the adjacent areas. The entire area involved in the pruritus may be injected at one sitting with no ill effects ensuing. There is rarely any tenderness or pain following this technique and it is seldom necessary to keep the patient at rest longer than a few hours. It is,

however, advisable to inspect the injection area every day or two for the first ten days or two weeks in order that any points which may be going to slough will be seen and kept dressed until healing takes place. It must be remembered that when injecting the areas over the sphincter muscle the alcohol should be injected subcutaneously rather than intradermally or deeper into the muscle.

The objections to this method are, (1), Many cases of anal pruritus which are severe enough to submit to this form of treatment present skin folds which are so deep that it is difficult to get a satisfactory injection of the alcohol with this technique; (2), There may be associated pathology which requires sacral anesthesia to perform, in which event this method is not suitable; (3), It is more difficult to judge just the right amount of alcohol to inject so that a cure may be effected but sloughs kept at a minimum or prevented altogether.

The advantages of this technique are that it does not require hospitalization and that, properly done, it is less likely to cause the formation of sloughing areas.

2. For those cases which have deep skin folds or associated pathology which requires attention, or in patients who are inclined to be unstable or easily disturbed emotionally, I would counsel infiltration with forty per cent alcohol, done under sacral anesthesia in a hospital, as advocated by Buie. Some patients with pruritus ani have a hypertonic sphincter which it is best to dilate. This may be done prior to the alcohol injection by gently inserting one index finger, then the index finger of the other hand, and after sufficient time has elapsed for the muscle and mucosa to stretch without tearing, a third finger is inserted. This provides an anal canal with a diameter as large as any stool which may enter it. Stretching the muscle to this extent will not rupture the fibers or cause hematomata to form under the skin provided sufficient time is taken for the dilatation. Personally, I never dilate an anus more than this.

In making the alcohol injection a needle of moderate length and medium gauge is used. This needle with a syringe full of forty per cent ethyl alcohol attached, is inserted thru the skin in the posterior midline at a point past the limits of the pruritic area. The needle is advanced directly under the skin to the anterior perianal zone where the injection is commenced and the alcohol infiltrated subcutaneously, exactly as one would infiltrate novocaine for anesthesia. Enough alcohol is injected so that the radiating

skin folds are ballooned out slightly. The area to be injected is readily seen in most patients by the appearance of the skin, but if this is not distinct it is well to ascertain this by marking the involved area before anesthesia is induced. It is desirable to have the distribution of the alcohol as uniform throughout the pruritic area as possible, as areas where larger amounts are placed may undergo necrosis and slough out. Frequently one may infiltrate the entire area with twenty-five c. c. of alcohol, but if the area is large as much as forty c. c. may be required.

Following such an injection many cases will show localized areas of skin necrosis, which in the course of ten to fourteen days will slough out and drain rather freely. I would estimate that seventy per cent of the cases I have done or seen done by this technique have exhibited some necrosed areas and this result is not to be considered unfavorable although the desired result is not dependent on the formation of these sloughing areas. It is desirable, however, to keep the necrosing areas under control so that unhappy by-effects may not ensue. I would caution anyone attempting such work to be sure no alcohol is injected intradermally, that none is injected into the sphincter muscles and that adequate care is given the patient postoperatively. It is any easy matter to have the sphincter muscle slough out if the operator is not careful to see that his injection is superficial to the muscle fibers.

The postoperative care is of vital importance in securing a favorable result. As soon as the patient is returned to his bed an icebag is applied to the anal region over a pack wet with witch hazel and kept on until all danger of severe inflammatory reaction and abscess formation is over. It must be understood that sloughs which occur following alcohol injection heal over somewhat more slowly than a simple operative wound; drainage is rather profuse and requires a change of dressings several times daily for a period of about ten days. The usual period required for healing to be completed is from six to eight weeks. I make it a practise to see these patients every day, clean and dress the ulcers and see that healing is progressing as it should.

RESULTS OF ALCOHOL INJECTION

The only remaining feature of interest is what results the patient may expect from this treatment. Very close to one hundred per cent of my own cases have obtained relief from itching; I have seen only one individual in whom the immediate result was not satisfactory and this man was relieved enough to permit him to re-

sume his occupation much as he had done before the pruritus affected him. Buie, using the second method described above, claims three per cent of absolute failure and an additional thirteen per cent of varying partial relief. On the other hand Stone, using the method described first, gets nearly one hundred per cent of complete relief. There is a remarkable change in the appearance of the pruritic skin within a few days following the injection; it becomes more normal in color, thickness and texture and the skin folds seem to flatten out.

The only objectionable feature of this treatment, in my experience, is the fact that a high percentage of the cases will recur in time; some will maintain their freedom from symptoms for several years while others will only be free for a few months. Dr. H. B. Stone reports that about seventy-five per cent of his cases experience a recurrence within three months to a year and that half of these required reinjection. This lack of permanence causes some people to reject the treatment but it can be repeated with no ill effect and the second injection will often maintain the beneficial effect over a much longer period. While the possibility of recurrence is certainly an objection to this treatment, it is nevertheless a better form of treatment than the Ball or Lynch under-cutting operations in that it is not so incapacitating and does not leave the dead space to fill in as these surgical procedures do.

It is noteworthy that a number of patients who have tried almost every other form of treatment, having received one alcohol injection, return when necessary for a second or third injection, even though they are aware of the chance of recurrence. This indorsement of the injection treatment by those who have run the gamut of all the forms of therapy means that until something better appears they are going to accept the best thing available in keeping themselves free of anal pruritus and its effects.

DISCUSSION

DR. R. W. HENDERSON, Bismarck: I have been particularly fortunate in that I have seen but two cases of this troublesome malady in private practice. Both of these patients dated the onset of their pruritus from the time of operation for hemorrhoids, the itching having been more or less continuous since that time. The etiology in these cases is believed to be a leaking sphincter ani, a result of injury to the sphincteric apparatus at operation. The itching area involves only the surfaces in the gluteal crease which are normally in opposition, and as there are present "moisture, warmth and friction in parts difficult to keep clean" (Andrews),

we have all the elements necessary for the development of an intertrigo, and perhaps this is the correct diagnosis. However, the itching is the complaint of the patient, and the ever-present irritating intestinal secretion is the cause, since by careful cleansing of the parts and the use of an adherent antipruritic ointment complete relief is afforded.

These new cases are mentioned because in looking over the literature available on this subject, it seems that every malady in the catalogue of ills is given, as a direct or an indirect cause of pruritus ani, but nowhere is mentioned the "leaking sphincter" following hemorrhoidectomy. It would be well for those of us who at times almost lightly advise hemorrhoidectomy to keep this possibility in mind, as the sequellae of a chronic pruritus may be even worse than those of unoperated hemorrhoids.

Dr. Bayard has given us a very excellent presentation of this subject for which I wish to express my appreciation at this time.

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SPONTANEOUS RUPTURE OF THE MYOCARDIUM

(Continued from Page 146)

which there was a large amount of blood in the sac. The right auricular appendage was completely inverted into the orifice of the mitral valve. Earl therefore feels that in this case the increased pressure in the sac caused obstruction of the pulmonary veins and that a potential vacuum was set up by the diastolic suck.

Treatment should be directed toward the prevention of rupture, for once rupture of any size has occurred treatment is of little avail. After the diagnosis has been made and one is aware of the changes taking place in the heart, one realizes that rest is the one most important thing. To insure this morphine or pantapone should be given in doses large enough and often enough to relieve pain and quiet the patient. Morphine often produces vomiting.

Since this is an undesirable feature, pantapone may be substituted. The use of oxygen has recently become of great importance. It relieves dyspnea, cyanosis, and to some extent the pain. It may be a life saving procedure. No attempt should be made to disturb the patient. Especially in the period in which necrosis is at its maximum the patient should be handled as little as possible. Only the parts accessible without moving the patient should be bathed. No attempt to move the bowels should be made. When they do move, the patient should be spared all possible effort. A nurse should be in constant attendance, and it is her duty to see that all of the patient's wants are filled without him using any effort. The diet should be soft, easily digestible, low residue and non gas forming. Although early, signs of decompensation may be present, no attempt to stimulate the heart with digitalis or other cardiac stimulants is indicated. After repair has begun, the stimulants may be indicated. For the arrhythmias especially ventricular flutter, morphine or quinidine are advised.

As long as fever and leucocytosis persist, necrosis is still present, and until they subside the danger of rupture is always present, and one should respect the situation. Once fibrosis is well under way the danger of rupture becomes more obsolete, and the treatment then becomes directed toward a deficient myocardium.

1. A case of spontaneous rupture of the myocardium is presented.

2. The etiology, pathology, and cause of rupture is presented.

3. Coronary Thrombosis, the direct etiological factor of myocardial rupture, is discussed.

4. The importance of rest and making the patient comfortable are stressed as a measure to prevent rupture.

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The Evaluation of Modern Diagnostic and Therapeutic Measures in Chest Disease*

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PART II

SEE PLATES 8, 9 AND 10

Carcinoma—Primary bronchogenic carcinoma, an increasingly common condition, is coming to the front.

Early in the onset, there is often a fairly typical sputum which has been described as apple jelly sputa. The earliest case the author has seen was a small nodule the size of a pea in a secondary bronchus but the sputum was typical. There was no weight loss.

Sometimes these cases have a frank hemoptysis as their first symptom but this is rare, usually the sputum is only blood streaked.

There may be little loss of weight or secondary anemia until it is well developed when the anemia and loss of weight become rapidly prominent.

Any case with unexplained blood tinged sputa or obscure, uncontrollable cough should be referred to the bronchoscopist for study.

Treatment—Radium to small centrally located processes and lobectomy for those accessible to surgery is the best line of treatment.

Bronchial polypl has a distinctive breathing if the polypl is large. There is an initial lag of the affected side followed by sudden expansion and a halting expiration. Here again we must rely on the bronchoscopist. Polypls sometimes cause hemoptysis.

*Read before the Staff of Lymanhurst School of Tuberculosis at Minneapolis, Minn.

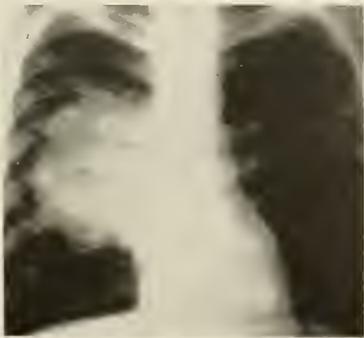


PLATE 8
BRONCHOGENIC CARCINOMA

Case of Dr. Harry B. Zimmerman: Mr. L., a young man 29 years of age, entered the hospital because of cough, night sweats and loss of thirty pounds of weight. Diagnosis, bronchogenic carcinoma of the right lung.

SEE PLATES 11, 12 AND 13

Pulmonary Tuberculosis—The symptoms being well known, a review of them is not necessary. May I call attention to the fact that many cases complain of previous attacks of influenza or nervous breakdown? The question is, were these attacks really nervous breakdown and influenza or were they evidences of their tuberculosis?

The history, sputa, physical findings and X-ray, of course are the best guides. Early in tuberculosis the catarrhal sputum is usually negative. It is well to note this point. The use of the clinical thermometer in suspected cases is to be advocated. The use of the thermometer in arrested cases is an excellent index to activity since crepitant rales persist in old tuberculosis. It is very rare that early hemorrhage from a tuberculous lung is sufficient to cause death. On the other hand, hemorrhage from a lung abscess or ulcerating bronchiectasis may demand immediate intervention. When the pulmonary hemorrhage becomes dangerous and pillow compression and morphine are of no avail, compression by pneumothorax will often stop the hemorrhage. In emergency a good way to accomplish this is to take a hypo syringe and fill it with five cc. of mercurochrome, sterile water or novocaine, as suggested by Lilienthal. By this means you can quickly tell if you are in the pleural cavity by the rate the fluid is sucked out of the syringe.



PLATE 9
BRONCHOGENIC CARCINOMA

Shows same case lateral view and the proximity to the anterior chest wall. Lateral views should be taken routinely if stereo pictures are not available.

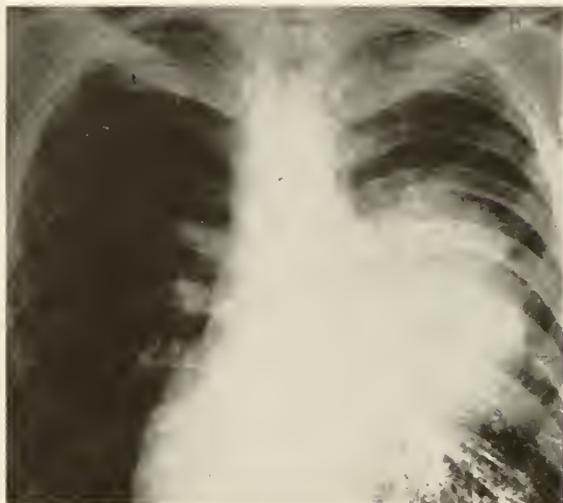


PLATE 10
BRONCHO-GENIC CARCINOMA

Same case after supra-cricoid lipiodol injection by the author. Note that no lipiodol has entered the tumor and there is no evidence of a blocked bronchus. Case inoperable. Left the hospital unimproved.

It is not always easy to get in the pleural cavity when a patient is coughing or struggling and the addition of liquid facilitates this. Air is then introduced until the hemorrhage abates. In multiple small hemorrhages, a phrenectomy or the resection of two ribs will often stop the bleeding.

There is one form of pulmonary tuberculosis about which I believe there is considerable misunderstanding because of its rarity. Most men think miliary tuberculosis as being a disease of bedfast patients. This is not always true, in fact, not infrequently the patient will be walking around feeling quite well. The author remembers a healthy looking colored girl who walked into the hospital complaining of a side ache. She said she felt well otherwise. This girl had a fever of 105 and we marvelled at her apparent health. She had a friction rub on the right upper front. She was put to bed but died some weeks later and the lungs were studded with miliary tubercles. The paucity of findings in these cases may sometimes be explained by the thickening of the visceral pleural incident to peripheral tubercles and the smallness of the disseminated tubercles.

In chronic ulcerative tuberculosis, of course, we aim at pulmonary immobilization to stop the pumping action of the lung which dumps the toxin laden lymph into the blood stream to cause fever, anorexia and night sweats, etc. We must choose the least radical procedure that will be effective. Pneumothorax is ideal when it can be used. Phrenic exeresis will cure some early

cases even though the lesion is apical. A combination of pneumothorax and phrenic extraction is advisable in some cases. In stretching adhesions by pneumothorax, there is one danger—viz: the tearing of the adhesion from its pulmonary attachment to cause hemorrhage or infection. For those cases where thoracoplasty is indicated the type of approach used by Drs. Thomas Kinsella and Jerome R. Head is advocated. May I call attention to the extreme importance of the patient bringing up his daily quota of sputa before operation? This prevents massive collapse, pneumonia and acute spreads. Post-operatively the patients must be carefully watched for blood pressure falls as intravenous therapy may be demanded. Thoracoplasties may be done in twenty minutes to one half hour but experience has shown that this is a poor plan. The patients get along much better by proceeding slowly and thereby inflicting a minimal amount of tissue injury.

A mediastinal flutter after thoracoplasty is serious. The symptoms and treatment are given in Lilienthal's excellent texts.

Thoracoplasties should not be used in children except as a last resort. The deformity in a growing child is often very great.

Vital capacity readings are only a rough guide to the number of ribs to be resected. Patients with a vital capacity of around 1000 or less do

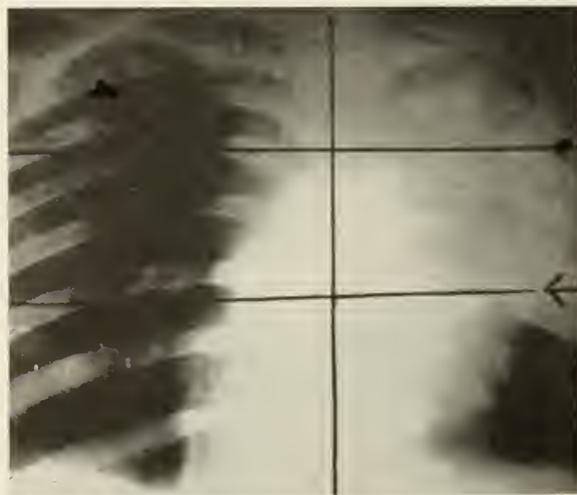


PLATE 11
L. PHRENECTOMY AND THORACOPLASTY FOR
PULMONARY TUBERCULOSIS

A case of Dr. W. D. Beadie: Mrs. K. had had pulmonary tuberculosis for three years and a positive sputa for an equal length of time. After a phrenectomy and thoracoplasty by the author her sputum was negative one month later for the first time since the onset. She gained a little weight. Subsequently, her sputum became positive and the weight stationary. She was advised to remain in the sanatorium one year and if no better to return for a lateral thoracoplasty although there is already good collapse. Notice the difference in length of the horizontal lines on either side of the midline and the elevation of the diaphragm at the arrow.

not as a rule stand thoracoplasty well and in such cases the graded thoracoplasty advocated by Dr. Hedblom is best. It is better to take only one or two ribs at a time in some cases.

Negroes, Indians and Mexicans do not tolerate tuberculosis well and do not respond well to chest surgery for its cure.

The operation of pneumolysis has but a very limited field. Today, it is used by surgeons more frequently than it should be used. Fatal complications occur too often in this operation.

SEE PLATE 14

In *Acute Empyema* early rib resection is often disastrous because the visceral and parietal pleura have not united. The lung shrinks to the mediastinal wall leaving an immense cavity. Should this happen the institution of closed drainage will alleviate this condition. Undoubtedly rib-resection is the best operation when it can be used but it has this danger. If a rib is to be resected, it is best to wait a week to ten days until firm adhesions have formed. Sometimes, because of severe toxicity, one cannot wait that long to establish drainage and aspiration is not sufficient. For these cases, closed drainage is ideal. Closed drainage is also ideal in moribund cases that will not stand a rib resection, also in tuberculous empyema failing on aspiration and in empyema with bronchial fistula. In streptococcus empyema aspiration is best but if this fails, closed drainage with Dakin's solution is preferable if there is no bronchial fistula. Dakin's solution in the bronchial tree often causes pneumonia, normal saline does not.

When an empyema becomes chronic and the cavity small, unless the patient is sure to have close supervision over a period of several months, the cavity should be completely obliterated by unroofing and thoracotomy. If you send a patient home without supervision and without obliterating the cavity, recurrence is likely.

Contrary to general opinion, chronic cavities are mushroom shaped when the white granulations are cleared away. They are not shaped like a test tube. Sodium iodide injections and X-ray of dozens of cases proved this.

The operation of decortication may be discarded in the future, at least, its use much more restricted. This operation has brilliant temporary results which only last about six months, when scar tissue reforms over the surface of the lung.

Dermoid Cysts—Sometimes when one thinks he is dealing with a chronic empyema, cholesterol crystals are aspirated. In such a case one should be suspicious of a dermoid cyst. The aspirated fluid looks like tomato soup with the seeds left in.

In such a case a small piece of tissue from the wall of the cavity will show the characteristics of a dermoid to the pathologist. It is true that cholesterol crystals sometimes occur in an old empyema

Complete extirpation of the dermoid is essential.

Lympho-Sarcoma, with compression of the



PLATES 12 and 13
BILATERAL PULMONARY TUBERCULOSIS WITH RIGHT
SIDED TUBERCULOUS EMPYEMA

Case of Dr. Samuel Miller and Dr. F. Coslett: Mrs. E. E., 30 years old, was operated upon for right sided lung abscess by her doctor. Wound never healed. She was sent to Drs. Miller and Coslett two and one-half years ago where her sputum was found positive for T. B. C. Under supervision she gained to such an extent that it looked as though she would get a cure without surgery. Then she began to decline, running a fever of 103. The difference can be seen in the left lung by comparing pictures A and B taken about a year apart. Note the empyema with a fluid level. Two indolent sinuses drained the cavity and she was running a fever of 103 and pulse of 120. After a right sided phrenectomy and intra-pleural washings with salt solution for two weeks, her temperature is normal, and the pulse 80 to 104. In this case a thoracoplasty will be done if the left lung clears up as it did previously. At present there is too much new involvement in the left side to consider a thoracoplasty on the right.

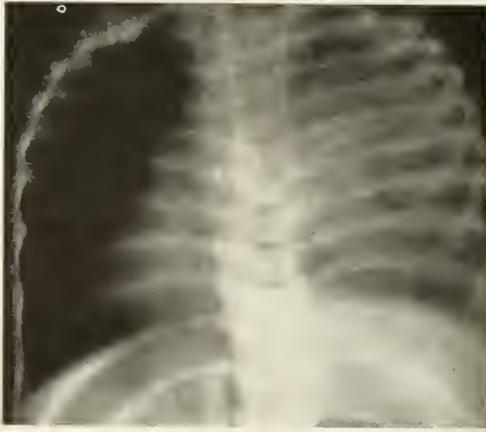


PLATE 14
ACUTE EMPYEMA (*Post-pneumonic*)

A case of Dr. J. T. Christison: J. W., a male, prematurely born at the seventh month of gestation. At 14 months of age, he developed a pneumonia followed by a left sided empyema as shown. Note that the rib shadows are not obliterated since the pus was very thin. When first seen the patient was listless, apathetic and running a fever of 104 degrees. He was too sick for a rib resection which would have resulted in a fatality. Under local in the room a No. 12 soft rubber catheter was inserted by the author into the pleural space between the seventh and eighth ribs posteriorly and the cavity washed out every two hours with salt solution night and day. Patient left the hospital well some five weeks later.

cervical sympathetics quite often gives Horner's syndrome of myosis, pseudoptosis and enophthalmus. There is also a tendency to perspire freely on the affected side.

X-ray is the best treatment.

Lung Hernia—Lung hernia may occur anywhere in the chest but is more frequent in the neck and anterior part of the chest. On straining, the hernia becomes distended with air which crepitates if stroked by the finger and gives breath sounds to the stethoscope if the opening into the sac is large enough.

The surgical treatment is imbrication, inversion or ligation and excision as the case demands. Care should be taken not to cause a pneumothorax during the operation.

Vein cyst, may cause some confusion with lung hernia in the neck. A vein cyst swells up when the patient strains. This condition is the result of an old varix of a large vein which usually has a small connection to the vein but sometimes the connection is obliterated and it will not swell on exertion. Sterile aspiration will leave no doubt as to the diagnosis.

The treatment is simple excision and ligation of the communication if present.

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THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF PYELONEPHRITIS

(Continued from Page 148)

remain in situ for prolonged periods of time. The duration of time that a catheter may be permitted to remain in the ureter is governed by the tolerance of the patient and by the quality of the drainage resulting from its being in position. The in-lying catheter is lavaged at periodic intervals in order that any debris and mucus may be evacuated from the kidney pelvis and to insure the catheter's patency at all times.

Many different drugs have been used for instillation and lavage. These may be used if the catheter is merely passed or if the in-lying method is employed. Chief among them are: saline and

boric solutions in the acute types, mercurochrome $\frac{1}{2}$ per cent, neosilvol and argyrol. Silver nitrate solution of from one half to three per cent is the best solution to use in the chronic pyelonephritic as it most effectively combats granulations and assists in causing the absorption of cicatricial tissue.

The use of vaccines both of autogenous and stock variety has had its advocates, but on the whole the results to date have been very disappointing, at least in my hands. Foreign protein or fever therapy is of distinct benefit where a perinephritis exists without abscess formation. Mercurochrome intravenously may be tried, or the employment of a fever producing dose of triple typhoid vaccine.

In certain extreme types of pyelonephritis in which the involvement is more advanced on one side, and in which no response to conservative treatment is noted, nephrectomy may be necessary. Braasch concludes that this may be safely undertaken even if the remaining kidney is involved to some degree. Nephrostomy with drainage thru the loin is sometimes as large a major surgical procedure as is possible and is usually employed with the idea of performing a subsequent nephrectomy. Nephrectomy is indicated in diffuse interstitial pyelonephritis, persistent gross hematuria, and in kidneys which have gone on to pyonephrosis formation.

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PHRENICECTOMY

(Continued from Page 152)

dealing with a bilateral diaphragmatic paralysis, who concludes his study with the opinion that the diaphragm does not play the important part in respiration that has been previously attributed to it.

Cases with persistent positive sputum have also been benefited. Bridge and Bly²⁸ report that 25 per cent of their previously positive cases became

negative following operation. O'Brien⁴ states that 52 per cent of his positive cases became negative, while Matson²⁹ obtained this result in 42 per cent of his cases, and Welles³⁰ reports the same percentage, and Frank and Miller²⁵ report a percentage of 38 per cent.

Speaking generally, from a purely symptomatic viewpoint, favorable results were obtained in about 70 per cent of the cases reported in this country. Not so optimistic, however, are writers in other countries.^{31 32} But even with this high percentage, I do not feel the operation should be done with impunity. Certainly it is open to discussion if it should be employed as some advocate in all incipient cases, and I think we should allow these cases to heal spontaneously if they will. Neither do I think it should be employed before some natural immunity has occurred against the infection. Phrenicectomy has a definite place but in closing let me remind all those interested that phrenic exeresis is a permanent thing. The phrenic nerve cannot be replaced once removed. Nor can any other muscle or group of muscles take the place of the paralyzed diaphragm.

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Proceedings Minneapolis Clinical Club

Meeting of January 12, 1933

ANNUAL SENIOR MEMBER PROGRAM

The President, Dr. Archie H. Beard, in the Chair.

IS THERE A CORRELATION BETWEEN THE DEGREE OF PATHOLOGICAL CHANGES AND THE CLINICAL MANIFESTATIONS?

DR. MOSES BARRON

(Summary)

It is a common experience to encounter patients presenting pronounced clinical symptoms without definite pathological findings. In the teaching of medical students, it is always emphasized that nearly all the clinical manifestations can be explained on a corresponding pathological basis. This, however, is not entirely true. Functional disturbances occur of a degree so severe that they apparently cause the death of the patient. Occasionally the death cannot be explained any other way by the postmortem findings.

A good illustration of the disconnection between the clinical manifestations and the gross and microscopic anatomical findings is the common disease diabetes mellitus. In about 15 or 20 per cent of the cases the most careful histological study reveals none of the changes such as fibrosis, hyalin degeneration or even hydropic degeneration of the cells in the islands of Langerhans to help explain the severe disturbances of metabolism which lead to the death of the patient. On the other hand, pancreases are found at postmortem which seem to be almost entirely destroyed by tumor masses, inflammatory changes or degenerative changes and yet at no time did the patient present any evidence of diabetes.

Another illustration is hypertension. Patients are frequently encountered with systolic blood pressure of 250 mm. or over, of long duration, with practically no symptoms and no findings relating to this hypertension. The cardiac enlargement may even be slight or only moderate and there will be no evidence of heart failure. Other patients under long periods of observation with the blood pressure remaining around 180, practically never above 200, have hearts enormously enlarged and with severe cardiac decompensation. There must be some factor or functional state of the heart muscle as yet quite undeterminable which plays an important part in the production of the marked enlargement with heart failure in the one case and the absence of this in the other.

Let us consider Hodgkin's disease. Some patients will present enormous masses of superficial and deep lymph node enlargements with very few symptoms other than the pressure effects. Others, on the other hand, will present a progressive downhill course in whom neither on clinical examination nor even at the

postmortem studies are there found any lymph node enlargements other than a few masses the size of navy beans which will show the characteristic histological structure of the disease. Certainly in such a case there is no correlation between the intensity of the disease and the pathological findings.

Coronary disease offers another illustration in which patients with very extensive sclerosis of the coronary arteries as found at autopsy will have had no symptoms of this during life while others with histories of severe anginal attacks, with death during one of these attacks, will show at autopsy only the mildest amount of involvement.

The reaction of the leucocytes is another example. It is generally considered that infections with the pus producing cocci produce high leucocytoses, yet, very recently a patient died of postabortive septicemia with streptococcus hemolyticus in the blood with myriads of colonies showing up in the blood cultures whose leucocyte count ranged between 8,000 and 10,000 throughout the course. At the autopsy there was found acute vegetative endocarditis of the tricuspid leaflets and a suppurative pericarditis present, yet the leucocyte count remained normal.

A more striking case to illustrate this fact was recently encountered at the General Hospital where a patient showed evidence of amyloid disease without any sources for this amyloid. About six months after the first diagnosis the patient was again admitted to the hospital where she died in uremia. She was admitted the first time because of weakness, poor appetite and a mild loss in weight.

The physical examination was entirely negative except for an enlarged firm liver, and palpable firm spleen, slight edema of the ankles and a marked albuminuria. Blood pressure was normal. On her readmission she had lost somewhat in weight, liver was a little larger than before, very firm, there was some edema, and the blood pressure had risen to 170/110. There was a small amount of ascites, she was very weak, had no appetite, was nauseated and vomited frequently. The urine now had fixed specific gravity and large amounts of albumin, some reds. There was a marked anemia, 53 per cent hemoglobin, 2,600,000 reds, 14,000 leucocytes, blood urea nitrogen 77 mgm., PSP test zero in two hours, xanthoproteic test 49 per cent. A diagnosis was now made of uremia which apparently developed rapidly. At the autopsy there were found bronchopneumonia with numerous acute abscesses in both lungs, advanced amyloid disease of the liver, spleen, kidneys and adrenals, the heart was only slightly enlarged.

The interesting findings in this case were the liver, spleen and kidneys. The cut surfaces looked waxy,

the normal markings were practically absent from these organs except in the kidney. The striking findings were in the microscopic sections.

The first section shows the spleen. It could scarcely be identified except for a trabecula present in the center. The entire spleen seems to have been replaced by amyloid with only a few lymphocytes present here and there.

The next slide shows the liver. It can be identified only by these fragmental, very narrow, liver cords of cells. From the appearance not more than 10 or 15 per cent of the liver tissue remains, the rest is all amyloid and this remaining liver tissue is atrophied and impinged upon by the amyloid deposit. It is thought that the liver is an extremely important parenchymatous organ for the function of the body. Nevertheless this patient presented no signs of liver dysfunction at any time. How can the patient live long enough to allow such an extensive process to obtain?

The next slide shows a section of the kidney from a case of acute glomerulonephritis where the patient died in uremia. Only a careful histopathologist would be able to say definitely that the arteries in the glomeruli were sufficient to cause death.

The next slide shows a section of the kidney from the patient with the amyloid. Both kidneys were uniformly enlarged. Not a single glomerulus in any of the sections studied shows anything to approach the normal functioning structure. You see only the outlines of the glomerulus filled with whorls of amyloid suggesting capillary loops but only occasionally can minute clefts be seen which represent the compressed glomeruli. Notice the extensive atrophy of all the tubules. It is impossible to visualize how such an organ can produce any excretory function whatsoever and it is difficult to see how a patient could have lived long enough to cause such an almost complete obliteration of the normal functioning parenchyma.

This discussion was presented to emphasize the fact that one must not overlook that functional disturbances may be all out of proportion to the anatomical changes present and that the clinical manifestations in many cases may completely overshadow the pathological anatomy present in a given case. The illustrative cases show that there is often no correlation between the degree of pathological changes and the clinical manifestations.

DR. A. A. ZIEROLD: I quite agree in Dr. Barron's surprise that anyone could exist with kidneys so seriously damaged. I should like to ask if any observations were made of the total nitrogen as well as the urea nitrogen. With such extensive damage to the liver it would seem reasonable to expect a relatively low urea nitrogen and a high total nitrogen. If so, I think that this might well be taken as evidence of impaired liver function or at least of a degree of liver damage.

DR. BARRON: That would be very true if we believed that the urea played any part in the formation of uremia. We think there are other substances which form in the blood that result in the final outcome.

DR. J. S. McCARTNEY: Might I mention that this patient had a liver twice normal size and so may have had an adequate amount of liver substance although anatomically there was very little normal liver tissue.

A CASE OF CYST OF THE KIDNEY RUPTURED INTO THE KIDNEY PELVIS

DR. H. M. N. WYNNE

Miss J. D., age 28, white, clerk, was seized with cramp-like pains in the abdomen and back about 9 P. M., September 24, 1930. She was nauseated and vomited frequently and passed three liquid stools during the night. Bright red blood was seen in the urine soon after the attack began. The diarrhoea, nausea and vomiting ceased in the early morning hours and the cramp-like pains became less severe and less frequent. Bright red blood was still present in the urine.

She was admitted to the Abbott Hospital on September 25, 1930, temperature 98.6, pulse 100. On admission the urine was grossly bloody, specific gravity 1.015, albumen 4 plus, sugar negative, no casts, occasional white blood cell and numerous red blood cells. The hemoglobin was 84 per cent and the erythrocyte count 4,590,000.

I saw the patient in consultation with Dr. Reuben Johnson, October 3, 1930.

On cystoscopic examination normal urethra, bladder and ureteral orifices were found. Bloody urine was spurting from the right ureteral orifice while clear urine came from the left orifice. Cultures from both urines remained sterile and no tubercle bacilli were found in smears.

(Showing X-ray films.) This film shows a filling defect in the kidney pelvis and a cavity in the cortex opening into the upper major calyx. There were no abnormal shadows in the film taken before injection. We interpreted this picture as a tuberculous cavity of the cortex with a blood clot in the pelvis.

Subcutaneous injections of old tuberculin (5 milligrams being given at the last dose) were made without any temperature reaction. The urine continued to



Rt. pyelogram. Gross haematuria. Cyst of kidney ruptured into the kidney pelvis.

be grossly bloody until October 7, 1930. Our diagnosis seemed improbable.

Operation: The right kidney was of normal size and appearance except a soft area in the region of the supposed cavity in the cortex as shown in the pyelogram. The outer wall of this cavity was thin and flaccid. There were two renal arteries on either side and well separated from a single renal vein. We felt that this area could not be safely excised and removed the kidney. The patient made a good recovery.

Pathological examination by Dr. E. T. Bell: A small amount of watery fluid was in the cavity which connected with the upper major calyx by a small opening. There were small hemorrhages in the mucosa of the pelvis. Microscopic sections showed small collections of lymphocytes throughout the cortex.

Diagnosis: Cyst of cortex ruptured into the kidney pelvis. Pyelonephritis.

This case illustrates an unusual pyelogram of a character that is generally interpreted as tuberculosis of the kidney.

A CASE OF NEPHROLITHIASIS FOLLOWING REMOVAL OF THE OPPOSITE KIDNEY

DR. H. M. N. WYNNE

Mrs. R. L. K., age 30, married, mother of twins, was referred by Dr. A. E. Cardle, April 13, 1930.

This woman had an attack of pyelitis in 1916. Her appendix was removed in 1921. In 1926 she had a severe toxemia and her pregnancy was terminated by Dr. R. T. LaVake by the introduction of a bag followed by version and extraction, twins being delivered. Some weeks after labor she had an attack of pyelitis and had similar attacks several times during the last four years. She had recently had pain in the right side of her back below the costal margin, nausea, dizziness and headaches.

Cystoscopic examination showed a greatly decreased excretion of phtalein and a purulent urine heavily infected with *B. coli* from the right kidney and a normal phtalein excretion and a clear urine from the left kidney.

(Showing X-ray film.) This pyelogram, taken April 14, 1930, shows several large calculi in the hydro-pyonephrotic sac. There is no shadow in the left kidney or ureter region.

(Showing second X-ray film.) This film shows a normal left kidney pelvis.

A right nephrectomy was done on May 29, 1930.

On November 17, 1931, due to pain in the left kidney region, X-rays were made before and after the administration of neoipax intravenously.

(Showing X-ray film.) This film shows a large calculus in the upper major calyx.

A left nephrostomy was done December 3, 1931, and the stone removed.

(Showing X-ray film.) This film, made October 28, 1932, shows no evidence of urinary stone.

This case illustrates the rapidity of stone formation in certain individuals.

A CASE OF STONE IN A SOLITARY KIDNEY AND LATER URETER STONE WITH COMPLETE ANURIA

DR. H. M. N. WYNNE

Mrs. W. W. H., age 44, married, para eight, was seen July 28, 1930, complaining of passing greenish-brown urine.

This patient first noticed that the urine was greenish-brown a week previous to examination. She had had slight discomfort in the lower abdomen for the preceding two weeks. She had never had any urinary symptoms before this illness.

Cystoscopic examination July 29, 1930: The bladder walls were normal in appearance. A No. 6 flute tipped catheter was passed up the left ureter without difficulty into the pelvis. No right ureter orifice could be found. Indigo-carmin, given intravenously, appeared from the catheter in the left kidney in eight minutes, none appeared in the bladder. The urine from the left kidney contained some white blood cells and numerous red blood cells, cultures remaining sterile and no organisms were found in direct smears. Guinea pigs showed no tuberculous lesions when autopsied after six weeks.

(Showing X-ray films.) This retrograde pyelogram shows the left kidney pelvis and a urinary stone at the base of the superior major calyx. No kidney shadow can be seen on the right side. Numerous other films failed to show any right kidney shadow.

This film, taken August 1, 1930, after skiadan had been administered intravenously, shows no trace of dye and no kidney shadow on the right side. The left pelvis is visualized as with the retrograde pyelograms and the stone lies in the inferior calyx. The left ureter is large.

Operation was postponed as we felt that there was a probability of having to do a nephrotomy with the stone in the top of the long inferior calyx. Since this was proved to be a movable stone we felt that it would probably drop back into the kidney pelvis where it could be removed with the least possible trauma. The patient was under observation and symptomless until July, 1931, when, after a two hundred mile drive over some rough road, she began passing dark red urine. An X-ray showed the stone apparently in the kidney pelvis. August 8, 1931, the stone was removed through a small incision in the pelvis. No other stones were felt. The kidney was large with the transverse diameter twice normal, the vertical diameter slightly increased and the anteroposterior diameter about normal. No X-ray was made before she left the hospital as numerous films showed only one shadow.

September 16, 1931, she had an attack of colic and passed a small stone about 2 mm. in diameter.

October 1, 1931, she was seized with severe pains in the left side of the abdomen and back, nausea and vomiting shortly began and continued until she entered the hospital October 4, 1931. There had been complete anuria for 48 hours.

Cystoscopic examination October 4, 1931. A catheter

met an obstruction in the left ureter 3 cm. above the bladder but was manipulated past the obstruction and urine immediately began to come through the catheter. There were a few white blood cells, red blood cells and colon bacilli in this urine. The catheter was left in the pelvis until the patient had recovered sufficiently for operation.

(Showing X-ray film.) This film shows the stone in the lower ureter.

October 7, 1931, two catheters were introduced to the stone which was then dislocated and pushed up over the pelvic brim. An extraperitoneal incision was then made and the stone removed.

(Showing X-ray film.) This film shows the two catheters extending above the pelvic brim and the stone just above their tips.

The patient has been symptomless since she recovered from the operation.

I believe this is a case of congenital absence of the right kidney. The evidence is as follows: The absence of a right ureteral orifice; a catheter in the left ureter drains all the urine excreted; no dye (indigocarmine) appeared in the bladder while a catheter drained the left kidney; there was no shadow in the right kidney and ureter regions after the intravenous administration of neoipax; there was no right kidney shadow in numerous X-ray films; the left kidney was unusually large. This evidence shows that this is physiologically a solitary kidney and anatomically the evidence is sustained by the absence of a right ureter orifice and by the absence of a kidney shadow in the X-ray films.

Andrew McNally, "Unilateral Renal Agenesis," *J. Urol.* 27: 289, (Sept.), 1932. This article discussed the subject, summarized 19 cases and reported one case. McNally states that the total number now in the literature is 466. The kidney was absent on the left side in approximately 75% of all cases.

A CASE OF RENAL TUBERCULOSIS IN A CHILD

DR. H. M. N. WYNNE

J. B., age 7, referred by Dr. E. D. Anderson, April 24, 1929, for a urinary tract infection first discovered during a life insurance examination by her family doctor. Cystoscopic examination showed a destructive lesion in the left kidney and a normal right kidney. Operation was refused. June 19, 1930, cystoscopic examination was made and a normal right pyelogram obtained. Urine from the right kidney was free of pus and bacteria.

July 3, 1930, a left nephrectomy was done.

(Showing X-ray film.) This plate shows a normal right kidney pelvis. The pelvis of the left kidney shows the typical moth-eaten outlines caused by tuberculosis and the ureter is dilated, elongated and irregular in outline.

Pathological examination by Dr. Grave was as fol-

lows: "The kidney measured 9x6x5½ cm. The surface was nodular. The pelvis was of normal size. There were large cavities in both poles of the kidney filled with granular purulent material which discharged into the pelvis. The larger abscess cavity measured 2 cm. in diameter. Tubercle bacilli were found in the abscesses. Microscopic sections showed typical tuberculous inflammatory processes."

Sanatorium treatment was advised and refused. January 20, 1931, the catheterized bladder urine contained pus and a few red blood cells and acid fast bacilli. We have been unable to get a report from this patient since.

This case illustrates the fact that children may have serious urinary tract infections unsuspected by their parents. It also illustrates the necessity for sanatorium care or at least intelligent home care under proper supervision following nephrectomy for tuberculosis.

A CASE OF PYONEPHROSIS WITH NEPHROLITHIASIS—NEPHROSTOMY AND HEALING WITHOUT REMOVAL OF STONE

DR. H. M. N. WYNNE

Mrs. R. E. F., age 34, white, mother of seven full term babies, first seen December 29, 1925.

This woman had had kidney trouble since her first pregnancy thirteen years ago and toxemia with each pregnancy. Six years ago she noticed a lump in the right side of her abdomen. This lump had gradually increased in size, and pressure over it caused pain. Her skin had been pale for six years. She had had dyspnea and palpitation on exertion for five years. Constant, dull backache had been present for two years. Her mouth and tongue were sore. Her hands and feet felt numb. After a complete physical examination, including cystoscopy, a diagnosis was made of right pyonephrosis with stone and secondary anemia.

(Showing X-ray films.) This film shows the large sac in the right side of the abdomen partially filled with opaque substance and the stone in the lower portion near the ureteropelvic junction. The ureter shows dilatation and two marked constrictions.

This film, taken after operation, shows that about half of the stone is left in the sac.

Blood examination: Hemoglobin, 30 per cent; red blood count, 3,000,000; white blood count, 13,600, polymorphs, 55 per cent. A transfusion of 600 cc. of citrated blood was given and the hemoglobin increased to 45 per cent and the erythrocytes to 4,000,000 before operation.

Operation February 2, 1926: Operation was done under nitrous oxide and oxygen anesthesia. The patient's pulse was 140 at the beginning of the operation and increased to 170. The kidney and perinephritic fat were densely adherent. An incision was made through the thinned out kidney cortex and about a litre of pus evacuated. The fingers were introduced and the stone felt deeply embedded and firmly fixed and the upper and lower limits of the cavity could not

be felt. In attempting to remove it quickly the exposed part broke off. On account of the patient's condition no further effort was made to remove the stone. The large cavity was packed with gauze.

Convalescence was slow but progressive. The patient was discharged from the hospital on April 8, 1926, with a draining sinus. After several months the sinus healed completely. At the time of her last visit in August, 1926, she said she was keeping house for her family and cooking for a road gang of sixteen men.

This case illustrates what may happen to the neglected case of supposed pyelitis of pregnancy. The possible relation of this kidney infection to her toxemia of pregnancy is of interest. It is most interesting to me that a sac of a pus kidney with a stone present should cease to cause symptoms and that the sinus healed. Adequate drainage through the ureter in such a case was not to be expected. When this patient was discharged I believed a secondary nephrectomy would be demanded as soon as her physical condition warranted. She refused to permit a cystoscopic examination after leaving the hospital.

A CASE OF CARCINOMA OF THE BLADDER
REMOVED BY OPERATION WITH DEATH
FROM CARCINOMA OF THE STOMACH
FIVE YEARS AFTER OPERATION

DR. H. M. N. WYNNE

Miss M. J., age 77, single, white, referred by Dr. E. L. Gardner, July 2, 1925.

This old lady had suffered for twenty months from haematuria and bladder distress. A clicking sound was distinctly heard when a glass catheter was introduced into the bladder. X-ray films showed a rounded mass in the bladder region, the outline slightly irregular and of greater density than the center.

(Showing photographs of X-ray films.) The original films were lost but these photographs will illustrate a cystogram with air showing a rounded body apparently attached to the left side of the fundus and a cystogram with fifteen per cent sodium iodide showing a filling defect on the right side and an area of less density just to the left of the midline of the fundus.

A suprapubic cystostomy was done July 8, 1925. A pedunculated tumor measuring 4x4x4 cm., covered with calcareous deposits, was found attached just to the left of the dome of the bladder. There was no induration of the bladder wall. The pedicle was cut off at the base and the base cauterized with the actual cautery. Three hundred milligram hours of radium was given by placing the capsule in a rubber catheter introduced through the suprapubic wound. The wound healed three weeks after operation.

Pathological Diagnosis—Squamous cell carcinoma of the bladder. (Dr. McCartney.)

The patient rapidly gained forty pounds in weight

and was free of all symptoms for about five years. On Easter Sunday, 1930, she began having abdominal pain and a lump appeared in the left upper quadrant of the abdomen. This lump was aspirated and white non-odoriferous pus obtained. The abscess was drained and an abscess posteriorly in the left flank was also drained. Five days later a fecal fistula developed in the posterior wound. In June another mass appeared in the upper left quadrant of the abdomen and some tissue was aspirated which was diagnosed "glandular carcinoma" by Dr. McCartney.

Autopsy July 18, 1930, by Dr. J. S. McCartney whose report was as follows: "The left pleural cavity contained one thousand cubic centimeters of fluid, yellow pus. There was an irregular ulcer ten centimeters in diameter on the lesser curvature of the stomach near the pylorus and along the greater curvature was a rounded, white, firm mass three centimeters in diameter. This mass was not connected with the head of the pancreas but was adherent to the transverse colon. The splenic flexure of the colon was adherent to the main gastric mass. The descending colon was tightly adherent in the left gutter. There were two cysts in the left kidney, the larger, three centimeters in diameter. The right kidney was normal. The ureters were normal. Aside from the operative scar in the anterior wall of the bladder, no abnormality could be made out. In the fundus there was a small area which suggested a scar, the probable site of the removal of the bladder tumor."

Microscopic sections showed adenocarcinoma of the stomach.

This old lady had unrelated carcinoma of two organs and was apparently cured of a carcinoma of the bladder but died five years later of a carcinoma of the stomach.

DR. LEO RIGLER: There is not much to discuss except that these were unusually interesting cases. We are doing intravenous urography. Dr. Wynne showed some of these and we are finding many cases with rather unusual and interesting findings. The tendency, for instance, is for men on medical service and surgical service to do intravenous urography not infrequently on cases where they suspect some kidney lesion. Here and there we pick up something that was not suspected without the use of intravenous methods in cases wherein one would hesitate to do cystoscopy.

DR. HARVEY NELSON: What preparation are you using?

DR. LEO RIGLER: Right now we are using Neo-Skiaden.

DR. ROY SWANSON: Dr. Wynne's presentation was extremely interesting. I think that when Dr. LaVake talked on the toxemias of pregnancy, he stressed the fact that in these toxemias, pyelitis played a part like any focal infection in other parts of the body. In pregnancy there must be some mechanical factor that starts ureteral dilatation with its consequent stasis and

infection. Pyelitis is unquestionably very, very frequent in pregnancy.

It is a peculiar thing that you will see any number of severe cases of pyelitis without any toxemia and then again you will see a great number of cases of toxemia without any pyelitis, so, as Dr. Barron showed in his presentation tonight, it does not seem to me that the question of pyelitis and toxemia are really correlated. I do not think we know very much about the fundamental cause of toxemia. We always look for an infection, and it can be present in the urinary tract as often as it is present in other foci.

DR. LEO RIGLER: Dr. Wynne showed these kidney stones in which the shadow on the film was very much smaller than the size of the stone. That is not an infrequent finding and should be borne in mind. About 20 per cent of kidney stones will give no shadow at all, not because of their size but because of their chemical character. The size in the film is not in any proportion to the size of the stone.

DR. J. S. McCARTNEY: In connection with the case of carcinoma of the bladder and the primary carcinoma elsewhere, you may see the sections here. The large section is from the bladder tumor and the other from the material aspirated from the abscess of the abdominal wall. I interpreted the one from the bladder as quite a malignant tumor from a histological standpoint and the other one was a glandular carcinoma, apparently an independent tumor.

At postmortem examination here was this very large ulcer on the lesser curvature, about 10 cm. in diameter which I interpreted as a primary carcinoma of the stomach. I do not think you would ever see a secondary carcinoma of the stomach that would reach that size and one of the interesting things about it was that in this case there were no metastases from either tumor.

In the last number of the *American Journal of Cancer* there is an article, devoted to the question of multiple malignancies, by Shields Warren and Gates and they find in the literature and with their own cases a total of 1,259 recorded cases of multiple malignancies. Here we are interested in the multiple carcinomas. They find that in this group of 1,259 some 242 were multiple carcinomas. An interesting thing about it is that of the 242, 61 were of the genito-urinary tract and of the gastro-intestinal tract. The others were of various other combinations.

PRESENTATION OF A CHEST CASE AS A PROBLEM FOR DIAGNOSIS

DR. STANLEY MAXEINER

Dr. Maxeiner reported a patient with a tumor of the chest wall who presented the following history:

Male; married; white; 37 years of age; sheet metal worker by occupation.

His family history was entirely negative. Personal history was negative. He denies venereal disease.

Present Complaint—In service, patient states he had a light touch of influenza but did not require hospitalization. As far as he knows his recovery was com-

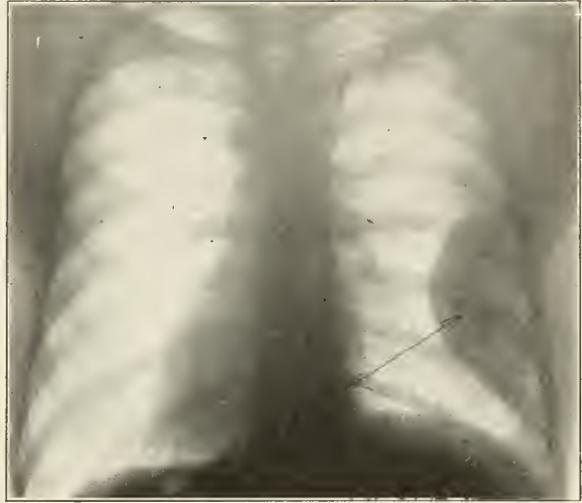


FIGURE 1

An anteroposterior view showing a large, rounded, smooth mass attached to the right thoracic wall and extending well into the thorax. It is rather dense in character but not nearly so dense as bone.

plete. About four years ago, he had an attack when he felt as if he could not take a deep breath and he could not stand a blanket or quilt over his chest. At that time there was no particular pain upon breathing, on cough or expectoration. Off and on for the past two or three years, he has had soreness in the right lower chest posteriorly which has been aggravated by breathing deeply or on ordinary breathing when he bends over. There has been no cough, no expectoration, no loss of weight, no hemorrhage, no night sweats and he does not experience easy fatigue. Temperature is $98\frac{1}{2}^{\circ}$ ordinarily. His present weight is 156 pounds stripped to the waist. His highest weight has been 170; his average weight, 162; his lowest weight in 1919 was 153.

Physical Examination—Reveals a well nourished, well developed white male, 37 years of age, who gives a history of having had some pulmonary pain and embarrassment on leaning forward or taking a deep breath for duration of approximately four years.

Examination of the chest: Inspection is essentially negative. There is moderate limitation of excursion of the right base. Palpation reveals decreased fremitus at the right base, and particularly the mid-axillary region. Percussion shows moderate to marked dullness over a considerable area in the right base in the region of the right axillary line. Auscultation over right lung shows absent breath sounds over this area of dullness. Left lung reveals no abnormal findings.

General systemic examination reveals:

Eyes: Normal; pupils react normally.

Ears: Negative.

Nose and throat are negative.

Heart and vascular system are negative, with blood pressure, 130/80.

Abdomen reveals slight tenderness on deep palpation over the right McBurney area and a questionable mass

underneath. This is not confirmed. Examination is negative for hernia.

Genito-urinary examination shows atrophy of both testicles, severe, secondary to mumps. Patient states he had parotitis and orchitis fifteen years ago with atrophy of both testicles. Both testicles are firm and not unduly sensitive to pressure. Epididymics are normal.

Spine: Negative.

Extremities: Negative.

Reflexes: Normal.

LABORATORY EXAMINATION

Urine: Acid; specific gravity, 1019. Albumen, 0. Sugar, 0. Occasional leukocytes. No red blood cells: no casts.

Blood Count: Red count, 3,300,000. Leukocyte count, 5,000. Differential count. P. M. N., 64. Small mononuclears, 28. Transitionals, 8.

Wasserman: Negative.

Sputum: Ten specimens of sputum examined were negative for tubercle bacilli.

X-ray of the gastro-intestinal tract reveals no demonstrable pathology.

X-ray of the chest shows a thickened, dense mass attached to the right pleural wall in the region of the right axilla which does not shift position with change of posture of the patient. Lateral films of the chest show another view of the same mass. The mass is smooth on its pleural surface and there is no fluid in the chest.

With the diagnosis of a mass attached to the right



FIGURE 2

A lateral view of the chest showing the rounded character of the tumor and its marked density.

lateral chest wall, an attempt was made to do a diagnostic pneumothorax at four different points but at no point could air be introduced into the chest cavity. An attempt was then made to aspirate the mass or to remove a portion of it by means of a large trochar for cellular study but this was entirely unsuccessful. The trochar, however, encountered a very hard inelastic, resistant area which gave the impression of a hard tumor rather than one containing any fluid.

Discussion—The first diagnosis in this instance was pleurisy with collection of fluid entirely encapsulated. Subsequently this diagnosis was changed to a tumor of the chest wall, benign. In arriving at a diagnosis, one must consider tumors of the thorax in general. These may be classified as primary or metastatic, and as benign or malignant. The same group of benign tumors may be found in the thoracic wall as might be found arising from skin and connective tissue elsewhere. In other words, the pleura may be affected by lipomata, fibromata, chondromata, osteomata and myomata arising in the neighboring tissues.

Lipomata have been found arising from the fat immediately beneath the pleura. The malignant neoplasms, primary and metastatic, which may develop in the structures of the thoracic cage are carcinoma (10 per cent) which may be contiguous or metastatic following carcinoma of the breast, sarcomata (60 to 65 per cent) and enchondromata (15 to 20 per cent), usually arising from the ribs, the sternum, thyrogenous tumors or hypernephroma. Neoplasms of the ribs favor the lower anterior part of the chest, are painful and metastasize early. They may grow outwardly and inwardly, giving rise to tumor pleurisy and are prone to recur if wide surgical removal is not performed very early. Sarcoma is much more malignant than the enchondromata which at times have a tendency to ossify and become stationary. In the malignant tumors, early and wide extirpation by single or stage operations may give a palliative or an entirely curative result. Fibromyxoma and chondrosarcoma arising in the chest wall may grow to large sized tumors which do not tend to invasion or metastasis and are especially amenable to removal. Pressure is their chief symptom. The spindle or round celled sarcoma, of course, displays an entirely different type of spread, with rapid invasion. Tumors of the testicle not infrequently metastasize to the pleura but are apt to involve the lung also. Tumors involving the chest wall, at first often considered inflammatory even under microscopic examination, not infrequently turn out to be endothelioma. These involve the pleura as white patches, tend to form adhesions and when these adhesions invade the other organs, should be suspected of being an endothelioma. Primary carcinoma of the pleura is reported to be extremely rare. Tumors of the pleura clinically display certain pleuritic symptoms such as pain, cough, fever, dyspnea and sometimes a livid condition of the overlying skin, and the clinical findings and character of the exudate of tumor pleurisy which is usually milky or hemorrhagic. Finally X-ray

examination, with or without diagnostic pneumothorax, aids in determining the diagnosis. Examination with the thoroscope and exploratory thoracotomy have been recommended in doubtful cases. The greatest prospect for a good result lies in the fibromyxomata and chondrosarcomata, while the only hope with the more malignant tumors rests in a radical early removal en bloc which often necessitates attack upon the thoracic cage, diaphragm or even resection of a portion of the lung itself.

We believe that in this case we are dealing with a nonmalignant neoplasm, and opinion has differed somewhat as to whether this patient should be subjected to surgical operation or not. I would very greatly appreciate a discussion of this case and to hear your opinions as to whether he should be operated upon, or be permitted to go on as he is.

DR. LEO RIGLER: If it is endothelioma you will not get anywhere removing it. If it is a benign tumor it would probably improve the symptoms. He is apparently suffering no disability.

DR. S. MAXEINER: The complaints I read were really minor.

DR. O. J. CAMPBELL: Why don't you do a biopsy?

DR. S. MAXEINER: A biopsy was considered in this instance but has not been done. I might say that this case has been rather interesting to us and there have been a good many discussions as to whether it should be surgical or not. When we found that the tumor had not changed from the incidental X-ray finding of one year previous, we felt that it probably was a condition which this man could carry the balance of his life without doing him any harm, and if it should be an endothelioma, we probably were not going to do him any good. At present, the patient is under observation and surgical treatment is being withheld.

DR. MOSES BARRON: To me this looks much more like an inflammatory mass than a neoplasm. It gradually shelves off at the edges. From the history it is of four years' duration with apparently not much change in structure. It looks to me like an encapsulated empyema with marked organization. We sometimes see empyema organized to a density of cartilage one-half inch in thickness. The only thing that does not quite fit in is the absence of an acute onset in the history.

DR. J. S. McCARTNEY: I remember that as a student I saw a patient who was quite a diagnostic puzzle. This man had a mass in his chest which was rather close to the diaphragm, more toward this than the

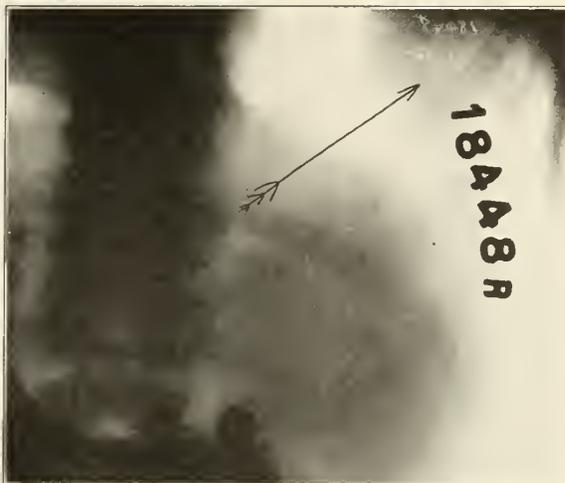


FIGURE 3

A film taken one year previously during a gastro-intestinal X-ray which reveals the presence of the chest tumor, and as compared with films 1 and 2, there has been no increase in size or marked change in character of the mass.

lateral chest wall. He had had a sudden onset of pain just before he came in and they saw a big mass in the X-ray picture.

They finally operated on this man and got out a mass which looked more like an ostrich egg-shell than anything else. It had a calcified wall approximately $\frac{1}{8}$ " thick.

DR. F. R. SEDGLEY, Chief, Surgical Service, Veterans' Hospital, Fort Snelling (By invitation): I have two reasons for believing this to be a benign tumor, probably a fibroma. One of my reasons is rather naive, in that when this case came up for consideration in looking up the subject I came across a picture that well might have been copied from a roentgenogram of this case. The case in point had previously been operated and diagnosed as a fibroma.

The other reason is the consistency of the tissue when we aspirated it—the resistance to the needle was that of an entirely fibroid tissue. Both a fine needle used for anesthetic purposes and a large trocar encountered the same unusually firm resistance which was apparently of homogenous consistency, and no tissue clung to an especially prepared trocar as frequently happens with ordinary neoplasms.

The meeting adjourned.

JAMES K. ANDERSON
Secretary pro tem.



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
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' Assn.
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MINNEAPOLIS, MINNESOTA, MARCH 15, 1933

THE BRATT LIQUOR RESTRICTION REPORTS

Altogether apart from any political stand that members of the medical profession may have taken in the matter of prohibition, they have always championed the cause of temperance.

It may be of interest therefor to note what the present liquor restriction system, popularly called the Bratt System after its originator, Dr. Ivan Bratt, has accomplished in Sweden.

According to an official report from the Liquor Control Board, the government in 1931 obtained a total income of 121,000,000 Kroner from the manufacture and sale of alcoholic liquor. The per capita consumption of these beverages for the same year was 5.48 litres as against 7.92 litres in 1913, the year immediately preceding the introduction of the system. The result may be shown more graphically as a 31 per cent reduction; or by reversing the data, it may be said that 44.5 per cent more liquor was consumed during the year just before the regulation went into effect than in the 19th year of its operation. During this same time, the number of cases of drunkenness in the police courts dropped 58 per cent.

We are quite safe in assuming that this has also contributed to the improvement in health conditions reported, and that in its 20th year, the system may be considered safely out of the spasm

stage of alternating changes so characteristic of local option days as we knew them in this, our country.

A. E. H.

MALPRACTICE CLAIMS

That the need for protection against claims for damages on account of alleged malpractice continues to exist may be readily verified by examination of a book recently published.*

A study of this collection of recent supreme court decisions in various States reveals some unusual facts. Of especial interest is the variety of conditions on which malpractice claims have been based. A few, chosen at random, may be mentioned: burns in removing adhesive tape, bronchitis from ether anesthesia, death attributed to mistaken diagnosis of intoxication in skull fracture, injury from improper diet after operation, septicemia following hypodermic injections, mistake in prescription by telephone and the usual varieties of fracture complications in the hands of general practitioners as well as others. These cases are mentioned to show not only the variety but also the apparently trivial nature of some of them. More important than anything is the fact, easily deduced from the

*Medicolegal Cases. Abstracts of Court Decisions of Medicolegal Interest, 1926-1930. Edited by William C. Woodward, M.D., LL.M., Director, Bureau of Legal Medicine and Legislation, American Medical Association, 1932.

foregoing, that no one is immune, least of all the general practitioner.

It is proverbial that few of these cases have any real merit but they must be met as they arise and fought without ceasing. Professional liability insurance is an essential thing, for litigation of this sort is expensive and beyond the means of most practitioners. Above all one must be able to establish, in any given case, that he used due diligence and rendered his services in accordance with the standards of skill prevailing in the vicinity of his practice, both by his own testimony and that of colleagues. Then he need have little cause for worry, for the principles of law are well established in such cases and Supreme Courts can be trusted to straighten out the record if juries fail.

G. C.

UNDULANT FEVER

In 1861 in the Island of Malta, Marston prepared some clinical descriptions of a type of fever which at that time was prevalent on the Island. He found that patients suffering from malta fever were anemic, complained of rheumatic and neuralgic pains, their fever ran a protracted course with a tendency to relapse. Twenty-five years later four fatal cases were reported by Bruce, who isolated the micro-organism causing the disease. This he called micro-coccus melitensis. Only persons who drank raw milk from goats infected with this micro-organism were found to develop malta fever. From the goats micro-coccus melitensis could be isolated from the urine, feces, vaginal discharges and the milk.

Bang, who made a careful study of contagious abortion in cattle, isolated the bacillus abortus in 1897. Twenty-one years later Evans found a very close relationship between the bacillus abortus and the micro-coccus melitensis. In fact, morphologically, culturally, and even by ordinary agglutination test she found them indistinguishable. Since Bruce first isolated micro-coccus melitensis this group of micro-organisms has been named Brucella in honor of him. Therefore, we now speak of Brucella melitensis of goats; Brucella abortus of cattle; and Brucella suis of swine. The disease in man which results from Brucella organisms is called undulant fever. The number of reported cases in the United States has rapidly increased since 1925. From 1905 to 1925, 128 cases were reported throughout the entire country; in 1927, 217 cases; and in 1930, 1385 cases were reported. In Minnesota alone, 72 cases were reported in 1931. In the United

States the disease is most frequently traced to cattle and swine. The diagnosis of undulant fever is not difficult. A careful history is of great assistance, since many of the patients use raw milk, are in contact with live stock, or with carcasses. The onset may be insidious or sudden, with chills and high fever as the first symptoms. Weakness, profuse sweating, generalized aching, joint pains, dizziness, abdominal pain, nausea, vomiting, cardio-vascular disturbances, irritability, and insomnia, are among the symptoms of which these patients complain.

The physical examination often gives little or no aid in diagnosis. In some cases the spleen is enlarged, and in some there may be generalized lymphadenopathy. The white blood cells may be slightly increased or normal in number. In some cases even leukopenia is present. Usually there is a relative lymphocytosis.

Laboratory tests are of great importance, the most common of which are the agglutination test; isolation of the organism from cultures of blood, feces, urine and bile; animal inoculations and intracutaneous tests. Many consider the agglutination test with a dilution of 1:100 as diagnostic. The duration of the disease is several months and because of its symptoms it is frequently confused with malaria, typhoid fever, and even tuberculosis. In the treatment of undulant fever, vaccines and dyes have been rather extensively used but, unfortunately, there is no universally accepted therapy.

Inasmuch as undulant fever is transmissible from domestic animals to man, the prevention lies largely in the control of this disease among animals and the proper preparation of animal foods for human consumption. The veterinarians are already hard at work and are meeting with great success in controlling the disease among animals.

J. A. M.

SOCIETIES

Minnesota Radiological Society

The Winter Meeting of the Minnesota Radiological Society was held at the Nicollet Hotel in Minneapolis, on Saturday, February 18th, 1933, at 2:00 P. M. The following program was presented:

1. "Pre-operative Diagnosis of Malignancy of the Liver with Thorotrast," Lester G. Ericksen, M.D., Minneapolis.
2. "The Physical Basis of Chest Radiography" (Work of R. G. Wilsey), and the Ruggles Cine-Cardiographic Film, Robert G. Morrison, Minneapolis.
3. "A Simplified Technic for Roentgenography of the

Optic Canals." John D. Camp, M.D., and Cesare Gianturco, M.D., Rochester.

4. "Atypical Findings in Bone Lesions," Charles G. Sutherland, M.D., Rochester.
5. "Roentgenologic Study of Bone Changes Accompanying Neurofibroma of the Spinal Cord and Associated Nerves," John D. Camp, M.D., Rochester.
Discussion by W. A. O'Brien, M.D., Minneapolis.
6. Case Reports from the University Hospital.
 - A. "Demonstration of Methylene Blue Method for Calibrating Roentgen Ray Dosage," W. K. Stenstrom, Ph.D.
 - B. "Achondroplasia, Advanced Ossification, Vertebral Osteochondritis," John B. Eneboe, M.D.
 - C. "Carcinoma of Breast, Skeletal Metastases, Response to Radiation," C. O. Hansen, M.D.
 - D. "Carcinoma of the Skin, Response to Radiation," Frederick B. Exner, M.D.
 - E. "Simulants of Mediastinal Masses," Leo G. Rigler, M.D.

The Society was honored by the presence of Dean Richard E. Scammon of the University of Minnesota Medical School who delivered a very illuminating and stimulating address on "The Contributions of Radiology to the Study of Growth."

At the business meeting a resolution was adopted endorsing the principles of the Code of Ethics of the Philadelphia Roentgen Ray Society.

The next meeting of the Society will be held in Rochester, Minn., May 22nd, 1933.

LEO G. RIGLER, M.D., *Sec.*

Woodbury County Medical Society Special Meeting

The Woodbury County Medical Society conducted a meeting devoted to "Medical Economics," February 23rd, at Sioux City, Iowa. About 200 physicians, dentists, pharmacists and veterinarians heard Dr. Oliver J. Fay of Des Moines read a paper entitled "A Discussion of the Report of the Committee on the Cost of Medical Care." The subject was further discussed by Dr. R. L. Parker, Secretary of the Iowa State Medical Society, Dr. T. A. Burcham, Dr. J. Brown, all of Des Moines, and also Dr. Wm. Jepson, Dr. J. E. Reeder and Dr. W. S. Petty, all of Sioux City. The following resolution proposed by Dr. Wm. Jepson was unanimously adopted by the society:

"While we of the medical profession recognize that it, in common with all professions, will undergo a continuous evolution to meet the demands of a constantly changing social structure, we, however, do not feel that this can be along lines advocated by the majority report of the Committee on Cost of Medical Care; but will be along channels such as shall from time to time be revealed to us acting in the best interests of the people we serve and the profession we represent."

L. E. PIERSON, *Sec.*

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. N. D. Kean, who was in active practice for over 25 years at Coleraine, Minn., died recently at Olathe, Kan.

Dr. Henry W. Cook, Minneapolis, was a guest speaker at a meeting of the Underwriters Club of Sioux Falls, S. D., last month.

Dr. A. E. Hetzler, who has been in active practice at Richardton, N. D., for several years, is now affiliated with the clinic at Mandan, N. D.

Dr. John E. Hynes, Jr., was married last month to Miss Virginia Miller, both residents of Minneapolis, and graduates of the University of Minnesota.

Drs. Abts and Trierweiler, Yankton, S. D., have dissolved partnership. Each of the doctors will continue practice in that city, but will open separate offices.

Dr. J. L. Devine, was elected president of the staff of the St. Joseph Hospital, Minot, N. D. Dr. L. H. Kermott, vice-president and Dr. M. J. Fardy, secretary.

Drs. Westby, Lee and Westby, Madison, have opened a branch office at Bellingham, Minn., for the convenience of their patients in that section of the state.

Dr. J. M. Thomson, a graduate of the University of Minnesota, is now permanently located at Browndale, Minn., where he has opened offices for general practice.

Dr. Fred A. Erb was elected president of the Hennepin County Tuberculosis Society, succeeding Dr. N. O. Pearce, who has served as president for the past five years.

Dr. A. G. Stoddard, who was one of the pioneer physicians of Renville County, Minn., died recently at his home in Spanish Fork, Utah, at the advanced age of 84 years.

The Northwestern Medical Society held their February meeting at Minot, N. D., when Dr. K. F. Bascom, Minot, presented a very interesting paper on "Old Medical Cults."

Dr. Fred Treon, veteran physician of over 40 years in active practice at Chamberlain, S. D.

is critically ill at the home of his son in Aurora, Ind., with no hopes of his recovery.

Lack of funds has caused the public nurse work to be discontinued in many of the counties of both Dakotas, but it is earnestly hoped that this work will be resumed in a short time.

Mr. William Mills, who retired as superintendent of the Swedish Hospital after 12 years of active service on March 1st, was tendered a banquet by the employees of the hospital.

Dr. and Mrs. Frederick B. Strauss celebrated their silver wedding anniversary at their home in Bismarck, N. D., on February 25th, where they have resided all of their married life.

Winona, Minn., has lost one of its leading and most liberal citizens in the death of Mr. John Deitze. For over 50 years he has been active in the building and support of the General Hospital of that city, his outstanding memorial.

At the monthly meeting of the Third District Medical Society held at Madison, S. D., last month, interesting papers were presented by Drs. R. S. Westaby, C. E. Sherwood and L. E. Jordon.

About 25 members of the Yellowstone Valley Medical Society held their March meeting at Billings, Mont., with a round table discussion on problems of importance to the profession. No formal program was carried out.

Drs. S. A. Donahoe and G. I. W. Cottam, Sioux Falls, S. D., have associated themselves in the practice of medicine and surgery in that city. Dr. Donahoe will continue in surgery and Dr. Cottam in goiter and chest surgery.

A bill introduced in the South Dakota Legislature proposes to prohibit licensed physicians from collecting in the courts of the state for travel while attending a patient a greater sum than 25 cents for each mile necessarily traveled in attending the patient.

Dr. P. O'Hair celebrated his 85th birthday on February 25th at Waverly, Minn., where he has been in active practice for the past 52 years. Dr. O'Hair was born in Ireland in 1848, coming to this country in 1849, and studied medicine at the University of Iowa.

Dr. J. A. Myers, Minneapolis, was the guest speaker before the Chicago Tuberculosis Society and the Board of Directors of the National Tuberculosis Association in Chicago last month. The title of his paper was "Some Drastic Changes in Our Conception of Tuberculosis."

Dr. George C. Wellner, Minneapolis, who has been in active practice at different cities in Minnesota for over 50 years, died at his residence in that city at the advanced age of 84 years. Dr. Wellner was president of the Goodhue County Medical Society in 1878.

Dr. Walter A. Sistrunk, former Rochester surgeon and associate professor of surgery at the University of Minnesota at one time, died recently from a heart attack in New Orleans. He was en route from his home in Dallas, Texas, to Atlanta to attend a medical meeting.

A meeting of the Iowa Tuberculosis Association was held at Council Bluffs on March 3rd, and among the leading papers presented were two by Dr. J. A. Myers, Minneapolis, "Tuberculosis, a Communicable Disease," and "Recent Developments in Diagnosis and Treatment of Tuberculosis."

The Lewis-Clark County Medical Society held their annual meeting at Helena, Mont., last month and elected the following officers to serve for the coming year: Dr. D. T. Berg, president; Dr. S. A. Cooney, vice-president, and Dr. B. C. Shearer, secretary. Dr. Geo. Barbour was elected a life member.

Dr. A. C. Strachauer, Minneapolis, is in New York this month to attend the semi-annual meeting of the Board of Directors of the American Society for the Control of Cancer. After the meeting Dr. and Mrs. Strachauer will vacation in Florida previous to taking a West Indies cruise and will return by way of Mexico City early in April.

The Fergus County Medical Society of Lewiston, Mont., were hosts to the dentists of that city this month. Two valuable papers were presented and thoroughly discussed. Dr. C. W. Cox paper was "Some Points in Common to Physicians and Dentists." Dr. James Shaver gave a paper on "Should all Pulpless and Imbedded Teeth be Removed?"

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on the evening of March 8th, when the following program was presented: "Trichomonas Vaginalis," Dr. Wm. H. Condit; "Post-operative Peritoneal Adhesions—Some Causes and Means of Prevention," Dr. Arthur E. Benjamin.

At the annual meeting of the Hennepin County Medical Auxiliary, the ladies elected the following officers, Mrs. Frederick Erb, president, Mrs.

G. T. Nordin, president-elect; Mrs. H. Wahlquist, first vice-president; Mrs. H. W. Quist, secretary; Mrs. W. H. Rucker, corresponding secretary; Mrs. C. Q. Stewart, treasurer; Mrs. J. A. Myers, auditor; Mrs. W. D. Roberts, custodian.

Dr. Kenneth Bulkley was re-elected president of the Minneapolis Surgical Society at the annual meeting held last week; Dr. Martin Nordland, vice-president, and Dr. F. A. Olson, secretary and treasurer. Dr. A. A. Zierold was named a member of the society's council. After the business session a clinical meeting was conducted with staff members of General Hospital.

A. G. Stasel, superintendent of Eitel hospital, was elected president of the Minneapolis Hospital Council at the group's annual meeting held this month. Other officers are Miss Rebecca Peterson of St. Andrews hospital, vice-president; Victor Anderson of Abbott hospital, secretary, and Sister Anna Bergeland of Deaconess hospital, treasurer. The Minneapolis Hospital Council is an organization of hospital superintendents, and meets monthly.

The regular monthly meeting of the members of the Sixth District Medical Society was held at Bismarck, N. D., last month, with a large attendance of outside visitors. Among those present were Drs. P. H. Burton, Fargo; G. E. Drew, Devils Lake, and John Crawford, New Rockford. Two guest speakers presented the following papers: "Fractures of the Spine," Dr. A. W. Ide, St. Paul; address by Dr. E. C. Stucke, State Senator, Garrison, N. D.

The Midwest Clinic, Rapid City, S. D., has been recently reorganized, with the following complete staff: Internal medicine and rectal diseases, H. J. T. Ince, M.D.; eye, ear, nose and throat, J. M. Walsh, M.D., F.A.C.S.; general practice, Earl W. Minty, M.D.; dentistry, R. B. Seaman, D.D.S.; urology, dermatology and proctology, R. E. Lemley, B.S., M.D.; obstetrics and pediatrics, R. E. Jernstrom, B.S., M.D.; general surgery, F. W. Minty, M.D., F.A.C.S., and clinic registrar, Edna A. Price.

On the invitation of the Chicago Regional Fracture Committee of the American College of Surgeons the Minneapolis and St. Paul Fracture Committees were invited to spend the day in Chicago on February 25th. Excellent clinics were enjoyed at the Presbyterian Hospital in the morning, given by Dr. Kellogg Speed, and clinics given at the Cook County Hospital in the afternoon by Dr. Cubbins and at the Billings

Hospital by Dr. Phemitser. The Chicago Committee acted as host, serving an excellent luncheon and ending the day with a dinner at the University Club. The following men from Minneapolis attended: Drs. Kenneth Bulkley, R. R. Crammer, D. A. MacDonald, Ivar Sivertsen, O. H. Wangensteen, R. C. Webb, Willard White, O. W. Yoerg and A. A. Zierold.

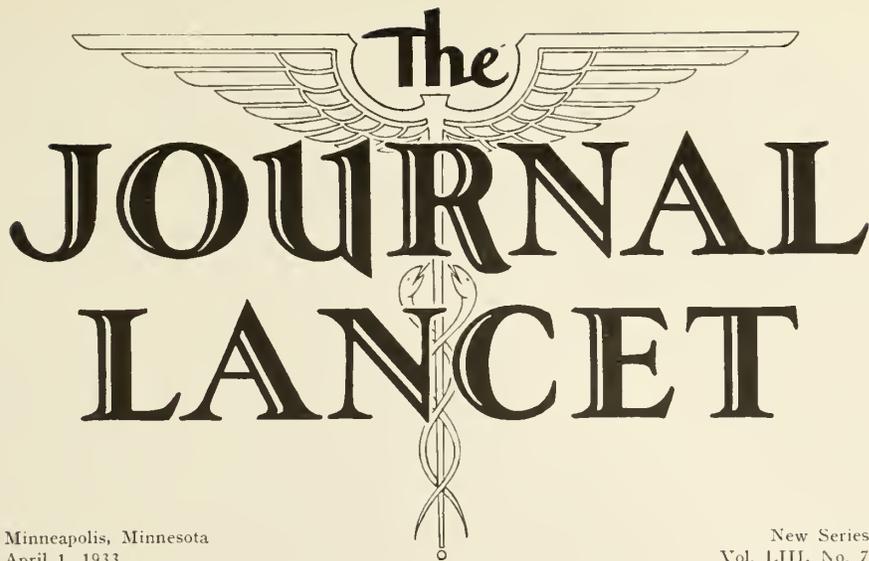
V. J. Zettel entered a plea of guilty to practicing healing without a Basic Science Certificate before the judge of the District Court in St. Paul. The defendant has no license to practice healing in any of its forms in the State of Minnesota. He was arrested following the treatment of a St. Paul man for varicose veins and ulcers. The patient claimed that the defendant guaranteed to cure him in eight treatments by the use of light rays. The patient became worse instead of better and finally was taken to the Ancker Hospital, where he was treated by licensed and reputable physicians. The Court sentenced the defendant to six months in the workhouse and suspended the sentence for one year. The defendant was placed in the custody of the Probation Officer and Zettel was warned by the judge as follows: (1) That the defendant close his office immediately. (2) That the defendant remove all listings from the building directory, telephone directory and city directory, and in any other place where he holds himself out to the public as being engaged in the practice of healing. (3) The defendant was warned by the Court to absolutely refrain from practicing healing directly or indirectly and he is not to attempt to practice in the office of either his father or his brother.

BOOK NOTICE

SURGERY, WITH SPECIAL REFERENCE TO PODIATRY, by Edward Adams, M.D., Prof. of Surgery, the First Institute of Podiatry of New York. New York, Int. Journal of Surgery Co., 1932. 480 pages.

Podiatry seems to be a sort of glorification of the lowly art of chiropody and this book apparently aims to enhance the beatitude still further by a background of general surgery and various allied sciences. The result is not convincing. There are many misstatements of basic fact and the umbra thus created is deepened by the obvious clerical and typographic errors which occur too frequently to be excusable. Against all of this it is proper to state, in all fairness, that the quality of the paper used is rather good.

GILBERT COTTAM, M.D.



Minneapolis, Minnesota
April 1, 1933

New Series
Vol. LIII, No. 7

SPECIAL TUBERCULOSIS ISSUE

Tuberculosis in North Dakota and What Is To Be Done About It

J. O. Arnson, M.D.
Bismarck, N. D.

THE incentive for the study which prompted the publication of this editorial came from the observation of tuberculosis in private practice. In spite of the great amount of constructive work which has been done in the education of the public by the agencies primarily concerned with anti-tuberculosis propaganda, we have been confronted by the same serious problems relating to the care of the tuberculous. In the majority of instances we have been seriously handicapped, not only in the treatment of the active case, but helpless in handling the contacts. Too often has it been impossible with our existing agencies to follow the case or ameliorate the intolerable situation. We cannot place the responsibility for failure to handle the tuberculosis situation more satisfactorily upon any organization, because we are satisfied that they are doing their best under the circumstances. However, it occurred to us that perhaps through some different co-ordination of their activities, funds and personnel a more efficient effort could be made, and perhaps our problem would be simplified.

In order to fully appreciate the problem which confronts us, it might be well to briefly state the present situation. There are now five to six thousand active cases of tuberculosis in North Dakota. The death rate from all forms of tuberculosis has fallen from 40.7 to 27.1 per 100,000 population from 1924 to 1931, but tuberculosis still is one of the chief causes of death for the

citizens of North Dakota. Perhaps the most significant fact to be derived from a perusal of statistics is the revelation that during late childhood, youth, adolescence and the prime of life, tuberculosis stands preeminently as the agency of destruction. Only in infancy and old age is the white plague superseded by other diseases. Note these figures, if you please:

In the causes of death for males between the ages of ten and nineteen, in the past five years, tuberculosis was second in one year and a close third in all the others, being superseded by "accidents" and "appendicitis" only.

For females between the ages of ten and nineteen, over the same period, tuberculosis was first by a large margin except one year when it was a close second to "appendicitis."

For males between the ages of twenty to forty-nine it was second only to "accidents."

For females between the ages of twenty to forty-nine it was first except in one year, 1927, when it was a close second to "maternal" causes.

This brief exposition of facts rather dramatically presents the problem facing the inhabitants of North Dakota. We have not even scratched the surface as far as solving the tuberculosis problem, and let me ask you what is being done about it?

In North Dakota, with from 5,000 to 6,000 active cases, we have one sanatorium with a capacity of 240 for the treatment of tuberculosis. From July 1, 1930 to July 1, 1932 four hundred

and sixty-three patients were admitted to the sanatorium. Of these, 109 or 25.1 per cent had minimal, 142 or 32.8 per cent moderately advanced, and 181 or 41.8 per cent had far advanced lesions. Four hundred and thirty-three patients were discharged during this period with the following classifications; apparently arrested 39 or nine per cent; arrested 95 or 22 per cent; quiescent 32 or 7.4 per cent; improved 148 or 34 per cent; unimproved 42 or 9.7. per cent; died 76 or 17.6 per cent.

The present situation at the sanatorium makes it woefully inadequate to carry on its work. There is a deficiency both in housing capacity and in personnel. Under what handicaps the institution is working is best exemplified by the remarks of the Superintendent in his last biennial report.

"The past two years have been attended by a constantly increasing waiting list and demand for infirmary space. What provision the State will make, if any, at the coming legislative session to relieve this constantly growing menace to the health of its citizens will be governed first by the State's finances, and secondly by the interest its citizens show in urging the members of Senate and House to provide increased accommodation for the State's tuberculous.

"Fully realizing and calling attention to the situation two years ago and fraught with anxiety at our inability to overcome it, we have employed every resource at our command to afford temporary relief. Two of the Institution's cottages heretofore employed for ambulatory patients we have reconstructed from within and are now giving infirmary care therein to twenty-four patients who could not otherwise have been admitted and cared for. We are now at the end of our resources and feel it our duty that the situation be made thus plain to our legislators and to all our citizens, reminding them as we further feel it our duty, that AN OPEN CASE OF TUBERCULOSIS WHOSE VICTIM, UNENLIGHTENED, AND CONSEQUENTLY CARELESS AS TO THE INFECTION HE SPREADS IN HIS FAMILY AND COMMUNITY, IS MORE OF A MENACE TO ITS CITIZENS THAN IS A MURDERER AT LARGE ENJOYING LIBERTY OF ACTION.

"Again we claim the attention of the law-makers to the State's lack of a field force to keep in touch with discharged tuberculous patients after returning to their homes, and report to health authorities the conditions found as to the patient's adherence to health sustaining regimen and to home sanitation."

The North Dakota Tuberculosis Association is another agency engaged in combatting tuberculosis. Its activities are supported by moneys derived from the sale of Christmas seals and private donation. In 1924 State aid was discontinued with the establishment of a full time State Health Officer. It employs one full time secretary. The annual budget is \$9,000 which is spread over the entire state and is used only for preventive work. One heavy project can be carried each year and the present project is the summer preventorium for malnourished children at Camp Grassick. The Association has not been able to be of service to the active tuberculous not hospitalized, except furnishing them with literature on request.

Through its county and town school health committees, who use 45 per cent of their local seal sale on anti-tuberculosis work, the Association advises checking of contacts. It also urges the use of the Mantoux tuberculin test, but this measure has not been utilized because of lack of co-operation with the medical profession. It also urges preventorium care for all child contacts at San Haven, if medical examination indicates its advisability. Ten per cent of the patients at the Summer Preventorium at Camp Grassick are contacts, but the tuberculin test has not been used routinely.

It is impossible to enumerate the work of the Association in detail, but it has been constructive and has been a potent factor in anti-tuberculosis work, but it, too, is woefully inadequate in dealing with the situation because of lack of funds and adequate personnel.

The State Health Department's activities have practically been confined to the compiling of statistical records. Even in this important activity it has been handicapped, chiefly through lack of co-operation in reporting cases by the medical profession. It was embarrassing for us to learn that if the Department depended on the initiative of physicians for these reports the mortality for tuberculosis would exceed the morbidity. In order to accurately determine the morbidity rates it has been necessary to make surveys and solicit reports from physicians. Because of inadequate funds the State Department is unable to engage in more constructive service to the active tuberculous and contacts than that possible through the activities of the local city and county health officers.

It is not necessary to further elaborate on the pathetic and unscientific manner in which tuberculosis is being handled in North Dakota. It is apparent to us all that practically nothing

constructive is being done to check the open active case and the contacts, the most important factors in the struggle to control and eradicate this disease. It is apparent, too, that the agencies engaged in this work are not sufficiently united to co-operate with each other to the best advantage.

What is the answer?

In Manitoba, under the direction of the superintendent of the sanatorium, an extension service has been developed which, through the co-operation of local physicians, serves the Province most admirably. Permit me to quote from Dr. Stewart's letter a brief description of this plan.

"The most economical and best way of having extension clinics in a small state or Province is to have them run from and by the sanatorium. We began about six years ago at places where we could borrow X-ray equipment; then we got our own portable so had a wider range; then to this we added a small portable, very effective generator which still widened our range, and this year I think we will get a truck which will carry portable X-ray, portable generator and a doctor, and X-ray man. We went to twenty-three centres last year and expect to go to quite a number of others this year. In all we have visited about sixty-five different centres. The twenty-five or thirty centres we expect to reach this year will cover the Province fairly well, even up as far as the Pas and even up into the sparsely settled country between Lake Winnipeg and Lake Manitoba (which we intend to visit).

Of course our permanent clinic at Winnipeg and Ninette take care of quite a wide area all the year around. Included in the travelling clinics is a service we give to the Mental Hospitals of the Province, which have no X-ray equipment. We examine as many of the patients as they wish to have examined and this helps them to segregate patients. Knowing also that Mental Hospitals have a lot of tuberculosis among their patients we examine Mental Staffs. We examine in some hospitals, also the pupil nurses, and make ourselves as useful as we can throughout the Province from cities the size of Brandon on down to places where there may not be more than two or three houses.

I strongly believe in making the sanatorium a headquarters. It is economical because dark room, X-ray equipment, staff, clerical staff, etc., are all there already and the little extra imposed on all of them is nothing like as costly as it would be to build up a new staff, headquarters and equipment. Then it is good for sanatorium people to get out and see where disease actually grows, and it is better for people not to be on

the road all the time. Travelling people should come in, inside people should go out. So, though we have a Central Tuberculosis Clinic in Winnipeg, which is the headquarters of sanatorium work in Manitoba, we still make Ninette the centre for clinics.

I will enclose an announcement of two of our clinics. Wednesday this week two doctors and an X-ray man and helper with the local public health nurse, open a clinic at Morden and will examine there in co-operation with the doctors, over two hundred tuberculous people, contacts, suspects, etc. We will then have a week at home cleaning up this clinic. The following week, Virden and Souris, then have a week cleaning these up. And so on. We have already examined this year 1216 people. In the winter we can do such a city as Brandon, working at the General Hospital, giving our services also to the Mental Hospital and then moving over to the Indian Industrial School which we have done for the last two years. By doing Indian Schools here and there we are getting a lineup on Indian tuberculosis which is a big problem.

We report on all patients examined to their doctors, also to the Department of Public Health, Public Health nurses, etc.

Working clinics in this way all over the Province and making X-ray plates of practically all, our costs run about \$2.27 per examination. In Ontario where there is a separate traveling clinic organization under the Provincial Public Health Department costs run up to about \$9.00. We charge against the clinics the time of doctors, X-ray men and the clerical work spent on them, both away from home and at home. The funds used for clinic purposes are provided by the sale of Christmas Seals."

The following is a copy of the type of letter sent by the Sanatorium to the physician in the centre to be visited by the clinic:

"Dear Doctor,

"We are glad to be able to announce a Tuberculosis Clinic in your district at the places and on the dates given below.

"I am sure all the doctors in the district know just what we try to have in a clinic. We don't want the general public sent in by themselves even on account of various real ailments.

"But we do want all who are known to be tuberculous, all who are suspected, all individuals and families who have been in contact, especially fairly recent contact, with open tuberculosis, and all who have pulmonary disease even if it is not known to be tuberculous. If there are any be-

(Continued on Page 191)

Symposium on Tuberculosis by the Staff of Glen Lake Sanatorium

INTRODUCTION

E. S. MARIETTE, M.D.

I WILL take this opportunity to explain certain points in the management of Glen Lake Sanatorium, which I hope will be of mutual benefit to physicians of the county as well as the institution.

(1) Private patients. We have no so-called "private patients." That is, no patients who pay the physicians for their services received at the Sanatorium.

(2) Question of non-residence. The Citizens' Aid Society has provided two beds for chest surgery which are available to any resident of the State of Minnesota at no expense to the taxpayers of Hennepin county either for construction or maintenance. The only other non-residents whom the Sanatorium knowingly admits are those cases whom the Health Commissioner has declared to be public health menaces. Such individuals are admitted immediately and then transferred to their own communities. All other patients are admitted upon the application of a physician only. Therefore you as a doctor can do a great deal in excluding non-residents by not signing applications for persons whom you know are not bona fide residents of Hennepin county.

(3) The Consumptive poor. It is claimed by some that the Minnesota sanatoria, both county and state, were originally intended for the consumptive poor only and that those who can afford to pay should not be admitted. That immediately raises the question as to who are the consumptive poor. Just how destitute must an individual be before he should be admitted to a public tuberculosis sanatorium.

The original law creating the State Sanatorium was passed in 1903 or about 30 years ago. The details of that law can be found in Chapter 316 of the Laws of that year. Section 8 of that chapter refers to the duties of the superintendent, the eighth duty of which is in substance to keep a list of persons applying for admission and treatment in the sanatorium in the order in which applications are received—providing such applicant has been a resident of the state at least one year preceding the date of application.

*Presented before the Hennepin Medical Society at its Wednesday noon meeting of February 1, 1933.

Section 9 states in substance that those who can pay shall do so at a rate to be determined by the State Board of Control and when a person is unable to pay such charges they may be assumed by the county commissioners of the county in which the applicant is a resident.

The County Sanatorium Law under which all the county institutions are operating was passed in 1913 or about 20 years ago. Section 6 of the original law states that the county sanatorium commission shall fix the amount to be charged for the care, treatment and maintenance of each patient.

This same section outlines under what conditions a patient may be admitted as a free patient.

Section 7 states in substance that any resident of the sanatorium district who has pulmonary tuberculosis is eligible for admission to such an institution and the superintendent shall, when conditions so warrant, admit that individual. This same section also states that of those eligible the urgent case must be given preference.

Thus no reference is made to the consumptive poor in those sections of the original State and County Sanatorium Law, which outlines those who are eligible for care and treatment in the county and state institutions. Furthermore, both laws as originally passed definitely make provision for the admission of the pay case.

So while it may be difficult now to determine the exact intent of the lawmakers, twenty to thirty years ago, still insofar as one can judge from a study of these two laws it would seem that any one who has tuberculosis and who has been a legal resident of the sanatorium district for one year prior to application is eligible for care in a sanatorium and that the superintendent is obliged to admit him as long as there is a vacancy. The County Sanatorium Law gives preference to the urgent cases while the State Sanatorium Law gives preference to the early cases. Aside from this slight modification the superintendents of the various institutions has no discretionary power concerning the admission of cases as long as there is room.

So much for the law. As a matter of fact, in actual practice when financial circumstances of the applicant or his family so warrant, we suggest that he go to a private sanatorium and leave the bed in the public institution for the person who

is unable financially to go to such an institution. Some follow that advice but if the individual insists upon his rights as a citizen, the superintendent under the law must admit him when his turn comes on the waiting list.

(4) Returning patients to the physicians who sent them in. We are very anxious that every patient who comes from a private physician should go back to that physician when he leaves the Sanatorium and we always urge him to do so. That is one of the reasons why except for consultants in the various specialties the Medical Staff of the Sanatorium is on a full-time basis rather than on a part-time basis. If the Medical Staff was on a part-time basis as some have suggested, very few of your patients would go back to you. They would all go to the chest specialist who attended them at the Sanatorium. If you will stop to think this through, you will realize that in adopting this policy the Sanatorium has done the one thing it could to make it possible for your patients to return to you.

It has been suggested that if the patients were discharged earlier, that is, as soon as possible, more of them might return to you. I think everybody believes that the patient should be discharged as soon as possible but there is a difference of opinion as to just when that is. Some suggest that it be after the sputum has been negative for tubercle bacilli for three months. What does that mean, negative by smear examination or by guinea pig examination? In that connection the following chart is interesting. It consists of two portions, (1) comprising 49 individuals who had positive sputum at one time but who had negative sputum for several months before a guinea pig was injected with specimens of the sputum and the guinea pig was positive. (2) A study of 27 individuals whose sputum was always negative to smear examination and still a guinea pig inocu-

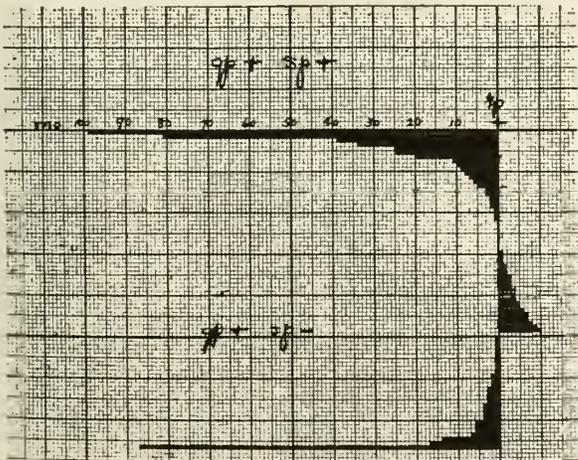
lated with specimens of this sputum was positive. The line to the left of the upright line indicates the number of months the sputum had been negative before a guinea pig was injected with sputum while the line to the right indicates the number of months which elapsed after the guinea pig was positive before tubercle bacilli were found in the sputum by smear examination. From this table it is safe to conclude that a negative sputum according to smear examination does not mean the individual is a safe person to have around children. Thus while we all agree that the individuals should be discharged from the sanatorium as soon as possible, there seems to be ground for a just difference of opinion as to just when that is.

We can all agree, however, that as physicians our first duty is to the patient rather than to ourselves and that as physicians we must prescribe the treatment which we believe will do the individual patient the most good. Some believe in many short time admissions, others in fewer long term admissions. Every one knows that doing the job well once is better for the patient and the community than doing it over several times.

This is true whether it be in repairing an automobile or repairing a human body. We believe in a fairly long period of hospitalization and insofar as one can judge from statistics, it would seem that our plan is working out pretty well in Minneapolis. According to the following table, the death rate from tuberculosis is falling considerably faster in Minneapolis, the largest city in the state, than it is in the state as a whole, and still we know that tuberculosis is largely a disease of the cities.

DEATH RATE			
Locality	1916	1932	% Reduction
Minneapolis	147.14	42.97	70.79
State	106.07	40.65	61.67
Diff.	No. 41.07	2.32	
	% 38.61	5.4	

These figures include the Minneapolis residents who died at the Veterans' Bureau Hospital, the State Sanatorium and Glen Lake Sanatorium as well as those who died within the geographical limits of the city. In studying these figures some might claim that the high death rate from tuberculosis among the Indians might be the reason why the decline for the state as a whole has been less than the decline for Minneapolis. But Minneapolis has its Negro population and I believe the high mortality among the Negroes will offset the high mortality among the Indians. I do not believe that this can be a valid explanation of the difference in the percentage reduction between Minneapolis and the state.



One may well ask what effect declining death rate has had on the incidence of tuberculosis as represented by new cases reported annually to the Health Department. While it is difficult to judge intelligently from reports of two years only, still they may be indicative of a trend. Perhaps they indicate that those forces for the control of tuberculosis which were begun so many years ago have set up enough momentum to carry on for awhile in spite of the depression. Furthermore they indicate that the relief work as carried on by the welfare organizations is adequate to maintain a fair degree of health as far as tuberculosis is concerned.

NEW CASES REPORTED

	1931	1932	Inc.	Dec.
Pulmonary Tuberculosis—				
Adult Form—				
Incipient	127	125		
Advanced	466	379		
Not Classified	126	150		
	719	654		65
Childhood Form	235	208		27
Primary Infection	275	488	213	
Other Forms	85	77		8
TOTAL	1,314	1,427	213	100

As you will see from the table there were 100 fewer cases of tuberculosis reported in 1932 than in 1931. According to the figures of the Health Department, however, there were 113 more cases of tuberculosis. This is accounted for entirely by the 213 additional cases of positive tuberculin reactions and merely indicates that a more intensive tuberculin survey was carried on in 1932 than was carried on in 1931. Taking the figures as a whole, it would seem that insofar as one can judge from a comparison of two years only the disease tuberculosis is diminishing in Minneapolis.

They would seem to indicate that the Sanatorium Commission was correct when in 1925 it decided to establish an Out-Patient Department where the dispensary patients could be cared for rather than erect buildings for additional beds at the Sanatorium.

You realize, of course, that patients have a great deal of time on their hands at the Sanatorium and one of their pet topics of discussion is their physician. The patient in the next bed to your patient may be so enthusiastic about his physician that he convinces your patient that his physician is the most wonderful doctor in the world. Therefore, it is only natural for your patient to want to try the other physician when he leaves the Sanatorium. This could be counteracted if you as physicians would keep up your contact with your patients while they are in the Sanatorium. Come out and see them, let them know you are interested in them, both as patients

and as individuals, let them know you are following their case while in the Sanatorium, that you are conversant with what is done for them there and that you are just as capable of continuing their treatment outside of the Sanatorium as any one else. In that way you can easily counteract sanatorium patient gossip and retain your patients. A few physicians are doing this and their patients are far better satisfied throughout.

AN X-RAY STUDY OF PULMONARY TUBERCULOSIS IN ITS RELATION TO PREGNANCY

FRANK L. JENNINGS, M.D.

The majority of physicians and obstetricians today believe that the tuberculous pregnant woman should be aborted. They base their opinion on the fact that they have seen a number of women break down with tuberculosis shortly after labor, or have seen a small lesion, noted either before or during pregnancy, become aggravated as a result of the pregnancy.

It is our opinion that there have been many factors, both social and medical, entering into the experience of these men which have not been properly evaluated, and that pregnancy and labor taken by themselves are not necessarily the factors involved. It may be they have not taken into consideration the fact that the tuberculosis could be controlled even though the patient were pregnant.

Because of definitely satisfactory results in permitting the natural culmination of pregnancy, we have not made it our practice for the last ten years to abort pregnant women who have come to Glen Lake Sanatorium with pulmonary tuberculosis.

It is my purpose to show the results of our work by a *single* means of observation, that of the X-ray, which is the most accurate single method at our disposal for observing pulmonary tuberculosis. Films are taken in our institution every three months and more often if necessary.

Chart I represents 27 cases that have been studied by X-ray before and after confinement. These cases have been reported previously in the American Review of Tuberculosis.¹ This chart in summary shows that before labor four patients extended their tuberculosis, and in three of these four there was a corresponding improvement of the tuberculous process in the contra-lateral lung (resolute or increased fibrosis have been recorded as improvement). Ten other cases showed evidence of improvement in their tuberculous pro-

1. Jennings, Mariette and Litzenberg: Pregnancy in the Tuberculous. American Review of Tuberculosis, Vol. XXV. No. 6, 1932, pp. 673-686.

*X-ray study of Lungs of women before and after confinement
Full Term Pregnancies*

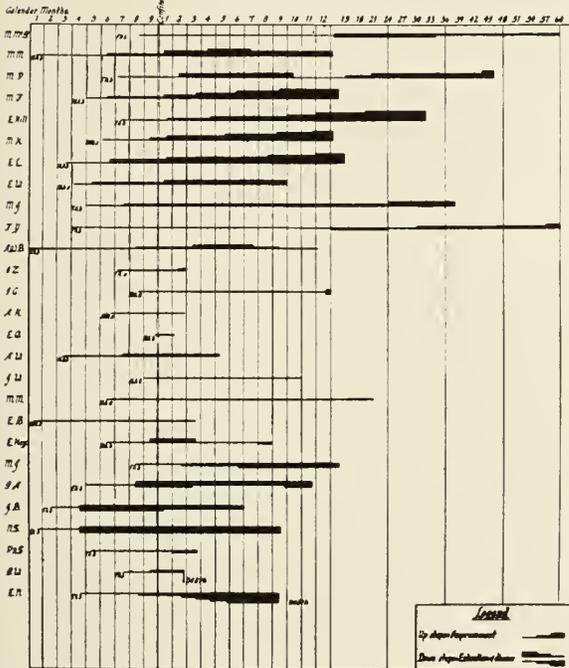


CHART I

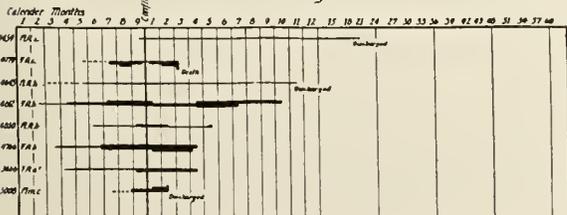
The perpendicular lines represent calendar months before and after confinement and the horizontal lines, individual cases. The length of horizontal lines denotes length of time each case was studied.

cess, and 13 showed no change from the time they were admitted until the time of their labor.

After labor, the chart reveals that 11 cases showed improvement in their lung lesions during the first three months, 11 showed no change in their lung lesions and five showed extension, one of whom died. Between the third and sixth month following labor, four patients showed improvement, 15 showed no change and two showed extension of their tuberculosis. We believe that after a period of six months subsequent to labor, we are not justified in attributing extension of a tuberculous process to the preceding pregnancy.

Since these 27 cases were charted, we have had eight additional studies which have not been published and these are shown in Chart II. A sum-

*X-ray study of Lungs of women before and after confinement
Full Term Pregnancies*



mary of these cases finds that two did not change from the time of their admission to their confinement, three showed an extension of their tuberculosis, one of whom had an improvement in the contra-lateral lung, while three showed improvement in their tuberculous processes. In three of these cases, we were fortunate enough to obtain films taken before their entrance to the Sanatorium and these films were compared with those taken at the time of entrance. In these cases, their condition is represented by dotted lines in Chart II. It will be noticed that in one of these cases there was no change, in another there was extension of the lesion, and in the third one there was improvement of the lesion in the time which elapsed between the taking of the films before entrance and at the time of entrance.

After confinement, during the first three months, three cases showed no change in their disease, four showed an extension of their lesions, one of whom died, and one showed an improvement. Between the third and sixth month three cases showed no change, one showed extension on one side and an improvement on the other, and two showed improvement. Three in the group are still under treatment with labor less than six months away.

In all we have had 35 tuberculous women (18 far advanced, 13 moderately advanced and four minimal) who have been allowed to go to term. Only three of these have died and their deaths were known to be inevitable after the first months of observation. These 35 women have given birth to 37 healthy children.

Therefore, this study does not support the theory that pregnancy should be terminated prematurely in the tuberculous woman. It must be said that the factor of treatment has been the thing largely responsible for the results here presented.

GENERAL MANAGEMENT OF PULMONARY TUBERCULOSIS

E. P. K. FENGER, M.D.

It is, of course, impossible to complete a discussion of this topic in the ten minutes allotted me. I finally decided to trace the course of a patient through the Sanatorium and in this way show the management of an uncomplicated case. I chose the case of "Mr. C.," age 34 years, admitted on January 7, 1927, with a diagnosis of far advanced pulmonary tuberculosis. He had the following symptoms: Cough, expectoration up to four ounces in 24 hours, chest pains, night sweats, nervousness and malaise. His sputum

was positive and the temperature ranged to 101.8 degrees and his pulse to 100. His weight was 106 pounds. Now let us take a look at the X-ray. This shows that there is a rather dense hazy infiltration in the right hilus at the level of the second and third interspaces and that there is a dense consolidation of the left upper lobe with a large cavity in the apex.

This man was put to bed on a semi-typhoid rest regime which means in bed 24 hours a day, nursing care for all his needs. We explained his case to him and he was told that his only hope "at this stage of the game" was rest and more rest. Edmund Jacobsen, in his book on "Progressive Relaxation," has said that rest: to overcome fatigue and exhaustion, thereby increasing the general resistance of the organism to infection; to decrease the strain on the heart and blood vessels; to diminish the nervous output; to quiet the nervous system; and to diminish the motion of the affected part or parts—is hard to teach. This requires that the patient have control of the nervous as well as the muscular activity; thus, no restlessness, no worry, no fidgeting, but complete relaxation is desired. Drugs could be used, but (1) they depress, (2) we often have to increase the dose, (3) they become a crutch.

This patient co-operated well and in spite of the fact that his wife and one child were admitted to the Sanatorium, he still kept himself in a cheerful state of mind. Three months later we examined him and had an X-ray. On physical examination he showed marked improvement and the conclusion on the X-ray report at this time read "remarkable resolution of the pneumonic process, left upper lobe. Cavity is not seen. Some resolution on the right side. There remains a fibrotic tuberculosis in the left upper and in the second and third interspaces on the right side." We found that his sputum had become negative, his temperature was normal, pulse never over 80, and his weight 124 pounds. At each subsequent examination, we always keep in mind the possibilities of some surgical collapse on one side or the other. We still could find no indications for collapse in this case. The patient was told of his improvement and that he should still remain flat in bed. We still felt that he should be kept on semi-typhoid rest regime. The next serial X-ray taken four months later showed further X-ray improvement on both sides. We then felt that his tuberculosis had become fibrotic and allowed him some freedom in bed. On December 13, 1927, or practically a year after admission, his X-ray showed a stationary lesion, he was symptom-free, so we began to get him out of bed. He

was allowed to sit up, later to go to the bathroom once a day and he was told that we would gradually allow him more freedom. His weight at this time was 137 pounds. His activity was gradually increased so that at the end of three months he had full bathroom privileges. An X-ray taken at this time showed a slight improvement, which means pathological activity in his lesion and he was held on this amount of exercise or muscular activity until he again showed a stationary chest lesion. This took place on June 11, 1928. He was then permitted to go to the main dining room for meals, later was allowed outside walking exercise and still later, a little work of a light nature around the Sanatorium. Due to the fact that his social and financial status was satisfactory so that he did not have to work immediately, he was discharged on February 11, 1929, as a moderately advanced case of pulmonary tuberculosis, condition arrested. His X-ray on discharge showed, on the right side, a thickening of the interlobar septum with slight fibrosis in the second and third interspaces; on the left side, fibrosis extending out from the hilus into the first, second and third interspaces anteriorly.

Now, even though many of our cases require collapse, their fundamental treatment remains the same. They are kept in bed until they show satisfactory lesions. If the patient spreads at any time while on exercise, he is again put back to strict bed regime.

Summing up, rest, with or without collapse, is given until a stationary lesion is obtained. Then the patient is gradually allowed increasing amounts of physical activity. They are discharged when they have had four hours of exercise for four months. If, at any period during their cure, they show improvement, they are held at this amount of exercise until they again show a stationary lesion.

The patients in favorable circumstances, where they can convalesce at home, are discharged after they have been on minimal exercise. Theoretically, it is possible to carry out this regime at home, however, from a practical standpoint, it has been generally found impossible.

THE CAVITY IN PULMONARY TUBERCULOSIS

SUMNER S. COHEN, M.D.

The early diagnosis and correct treatment of cavitation in pulmonary tuberculosis is important because the end result will often depend upon the recognition of its presence and the success of its control. Briefly the steps in its development are

infiltration with exudation, followed by caseation; this caseated area sloughs and is then extruded through a bronchus leaving behind an anatomical defect which we designate a cavity. It is to be remembered that a cavity may develop at any time in the course of a given case, that it may form within a very short period of time and this development may take place even in the face of clinical improvement.

The true incidence of cavitation is hard to determine. We analyzed 548 cases of adult type pulmonary tuberculosis in residence at Glen Lake Sanatorium on January 18, 1933. We eliminated those whose lesions were primarily extra-pulmonary, those with childhood type of tuberculosis and those in whom the diagnosis of tuberculosis had not been confirmed. Of the 548 cases, 121 (22.08 per cent) had no cavitation on admission, 309 (56.38 per cent) had unilateral cavitation with or without a lesion in the contralateral lung, and 113 (20.62 per cent) had bilateral cavitation, while five (0.92 per cent) had pneumothorax on admission so that we were unable to determine the underlying pathology. In other words at least 77 per cent of all cases in residence with the adult type of disease had cavitation, on one or both sides, on admission. If we would add those in whom cavitation developed after admission the percentage would be even higher.

There is a definite relationship between positive sputum and cavitation. Positive sputum was found in 58 per cent of cases without cavitation while it was found in 91 per cent of the cases with unilateral, and in 92 per cent of the cases with bilateral cavitation. Our greatest problem in tuberculosis control today is the unrecognized or uncontrolled cavity case with persistent positive sputum.

The diagnosis is usually made by X-ray, and all annular shadows should be considered cavities until proved otherwise. Bruns and Barnwell¹ have shown the accuracy of the X-ray diagnosis when checked by post-mortem examination. Physical examination, based on cavity findings as outlined by the National Tuberculosis Association, is on the whole unsatisfactory. Over 50 per cent are silent as far as physical examination is concerned. It is also of interest that the early cavity case is the one least likely to have physical findings. A positive sputum is confirmatory evidence in the diagnosis, but a persistently negative sputum by smear, animal inoculation or culture should be regarded with suspicion although cavitation without a positive sputum does occur. Examination of the blood is only confirmatory in the diagnosis. The blood smear, by itself, can in no

way be considered diagnostic. The usual blood picture is one in which there is an increase in total white blood cells to 10,000-12,000 with an increase in polymorphonuclear cells to 70-75 per cent. The lymphocytes are decreased to 15-25 per cent and the large mononuclear cells show an increase to about 10 per cent—occasionally more.

The cavity is a source of danger to the individual himself because of its complications. These are: (1) *Hemoptysis*—with its resultant danger to life and the spread of the disease in the same or opposite lung; (2) *Spread*—bronchogenic dissemination of the disease by means of infected sputum or blood; (3) *Chronicity*—the development of a thick fibrous capsule resulting in a chronic cavity which, as is well known, is difficult to control; (4) *Adhesions*—the formation of adhesions about the cavity involving the pleura and preventing collapse by the more simple measures such as pneumothorax. Thus a delay in inducing collapse frequently results in a chronic cavity with persistent positive sputum, the end result being a far advanced hopeless case of tuberculosis. Examples of this type are all too frequent even today when we have measures of control which will usually be successful if applied early enough.

The treatment must be based on the fundamental factors in the control of a cavity namely the apposition of its walls and the healing of the tubercles and ulcers in the lining membrane. The end result must be closure and elimination of active infection. The correct treatment for any case is the one which facilitates this end result. Obviously the treatment must be varied for different cases and all cases will not respond to any one type of procedure. Rest to the affected part is still the basic factor. Occasionally bed rest may be sufficient, but our experience is that the spontaneous closure of cavities by this means alone is disappointing. It is usually necessary to employ the various types of collapse therapy in addition to bed rest. No one type of collapse, such as pneumothorax, is successful in all cases, and one must resort to other procedures such as phrenic nerve operations or thoracoplasty. The only safe cavity is one that is closed and remains closed, so we must use all the various methods at our command to bring this about.

The prognosis of uncontrolled cavitation is exceedingly grave. Barnes and Barnes,² in a study of 1,454 cases, found that 80 per cent were dead within one year, these being cases without attempted control by collapse measures. It is not possible in this paper to discuss the subject of collapse therapy and its satisfactory results, ex-

cept to mention some figures published by Peters.³ He reported 427 cavity cases on whom he had attempted pneumothorax. In the group of cases that obtained good collapse only 24 per cent had died, while in those that had a poor collapse, 44 per cent were dead, and in the group in whom no collapse was possible, 60 per cent were dead, so that even a poor collapse apparently is better than no collapse at all.

CONCLUSIONS

1. We should watch carefully for cavity formation as it may develop at any time even in the face of clinical improvement.

2. Roentgenograms are by far the most accurate single diagnostic aid.

3. Cavity findings are absent by physical examination in a large percentage of proved cases.

4. Collapse therapy should be considered in all cavity cases especially if bed rest has been tried without success.

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CRITERIA OF ACTIVITY WHEN AN X-RAY LESION IS PRESENT, OR A DISCHARGED PATIENT RELAPSES

VICTOR K. FUNK, M.D.

Brown and his associates at the Trudeau Sanatorium have defined Clinical activity as that state in which pathological activity is no longer latent, but is producing through absorption of toxins or destruction of tissue certain clinical or laboratory manifestations of disease. The recognized signs of this activity are fever, rapid pulse, constitutional symptoms such as fatigue, gastro-intestinal irritation, malaise, irritability, insomnia, etc., loss of weight, night sweats, hemoptysis, pleurisy, spontaneous pneumothorax, expectoration with or without cough, with or without tubercle bacilli, medium coarse rales or crepitations. By pathological activity we refer to a tuberculous lesion which is showing change. This change may be demonstrated by physical examination, but more often by X-ray changes. Commonly the term "pathological activity" has been restricted to those changes which are of a progressive nature, but strictly speaking the term applies equally to changes of a retrogressive character.

When the rest cure was first instituted it was found that when tuberculous patients with constitutional symptoms were placed on continuous bed

rest, often a great change occurred after a few months. They gained weight, temperature and pulse became normal and all symptoms disappeared. This startling change caused clinicians to believe that pulmonary tuberculosis was easily cured and after a short period of treatment they considered such cases arrested. The introduction of the X-ray, however, has shown conclusively that absence of constitutional symptoms has but slight bearing on the activity of the lesion. It is now evident that although clinical symptoms may disappear rapidly the tuberculous process in the lung often clears and heals very slowly and usually only after years of prolonged and continuous rest.

The determination of activity may sometimes be very difficult and yet the question of its presence is a constantly occurring one in the treatment of any tuberculous patient in or out of a sanatorium, for on it depend the prescription of rest and exercise and the regulation of the patient's life. The fundamental problem in the early diagnosis of minimal tuberculosis hinges upon the question of whether pathological activity can be detected before clinical activity, in other words, how early can changes of a progressive nature be detected which will indicate the transition from health to disease, or in the case of known disease from a healing or quiescent process to one of actively advancing disease.

This paper will not be concerned with the diagnosis of pulmonary tuberculosis except to point out that given a patient with X-ray findings of pulmonary tuberculosis the diagnosis of non-clinical or inactive pulmonary tuberculosis is arrived at by the exclusion of all the other diagnostic criteria and all clinical and laboratory signs of activity. Rather it should be emphasized that pathological activity, both in the direction of healing and of progression often occurs without any constitutional symptoms of this change. Unfortunately spreads of the disease are not uncommon and are to be found in patients still on the cure as well as in those whose disease has been arrested. The following are a few of the many tests which have been proposed to solve the problem of the early detection of spreads or the existence of pathological activity in the absence of symptoms. Blood sedimentation, diazo reaction, Verne's test, Daranyi reaction, Matefy reaction, phosphatide precipitin test, leukocyte reaction, lymphocyte-monocyte indices, and X-ray studies.

Probably the X-ray is the most reliable of the methods so far in use, although some observers report that frequently changes in the blood sedimentation rate and leukocyte reactions precede

X-ray changes. Nevertheless the X-ray changes are definite and typical. Pathologically active tuberculosis differs materially from healed tubercle or the resulting scar tissue. Shadows of recent tubercle formation are nebulous and cause a mottled, fluffy or cotton ball appearance, blending gradually with the surrounding lung tissue, interpreted as due to perifocal inflammation or hyperemia accompanying the tubercle formation. Whenever this picture can be demonstrated pathological activity is present. As the lesion improves, more and more of the fuzziness disappears, the tubercles become more compact and discrete until ultimately the films show a preponderance of wiry or string-like shadows or dense discrete mottling. Healing and progression may occur simultaneously.

In conclusion, the lesions of pulmonary tuberculosis may remain quiescent for long periods of time or they may improve or they may increase, with or without any clinical signs of activity. When constitutional signs such as fever, rapid pulse, fatigue, malaise, loss of weight, night sweats, etc., are present, we are dealing with active disease. A lesion showing X-ray change is interpreted as still being pathologically active, even though the change be in the direction of healing. A lesion clearing by resolution is considered more prone to remission than one healing by increasing fibrosis.

DIFFERENTIAL DIAGNOSIS OF TUBERCULOSIS

DOROTHY W. HUTCHINSON, M.D.

In the past three years, of 1279 patients discharged from Glen Lake Sanatorium, 111 had lesions that did not require sanatorium treatment. Of this group, forty-six had what we designate as non-clinical tuberculosis, in other words, an inactive tuberculous lesion. The other group of sixty-five were non-tuberculous cases in whom a diagnosis of tuberculosis had been made prior to admission. (See following table)

DIAGNOSIS IN NON-CLINICAL AND NON-TUBERCULOUS CASES

	46 Non-clin.	65 Non-tbc.	Total
Upper Respiratory	10	4	14
Lower Respiratory	9	19	28
Bone and Joint	0	7	7
Heart Lesions and Hypertension.....	3	6	9
Dental Conditions	3	3	6
Asthenia	3	2	5
Pregnancy	1	4	5
Neoplasm	0	3	3
Ulcerative Colitis	0	1	1
Chronic Glomerular Nephritis	0	1	1
Chronic Empyema	1	0	1
111 Cases, 8.68% of 1,279 Patients, Discharged from 1930-1932			

The upper respiratory diseases were comprised of lesions of the sinuses, ears, tonsils and cervical

nodes. The lower respiratory lesions included cases of bronchiectasis, lung abscess, asthma, unresolved pneumonia, gangrene of the lung and pneumoconiosis. The cases of asthenia included three adults with psychasthenia and two children with marked malnutrition who reacted negatively to tuberculin. Five pregnant women were admitted because of symptoms suggestive of tuberculosis.

The procedure we follow in making a diagnosis of tuberculosis is the correlation of facts obtained by the following steps: Physical examination; the presence of moderately coarse, post cough rales, especially over an upper lobe. Sputum examination; the presence of tubercle bacilli, either by direct smear or by animal inoculation. (The absence of positive sputum does not in itself exclude tuberculosis.) X-ray examination; the presence of a parenchymatous lesion especially in an upper lobe. (Comparative films over a period of time may be necessary.) History of pleural effusion or hemoptysis. The presence of pleural effusion or hemoptysis from an unknown cause must make one suspect tuberculosis while the two conditions existing in the same individual unless explained on some other basis constitutes a diagnosis of minimal tuberculosis. Tuberculin test. A positive reaction will occur in many who have no other evidence of tuberculosis. Therefore, a negative reaction to a sufficient amount of tuberculin is our best evidence of the absence of tuberculosis. It is of interest that of fifty-three of the non-tuberculous group so tested, twenty-two were found to have a negative reaction.

Certain cases require special examinations, for example, the diagnosis of bronchiectasis and lung abscess may be aided by bronchoscopy, iodized oil injection, and examination of the upper respiratory tract.

Of the chest lesions simulating tuberculosis, bronchiectasis is the one which is most commonly confused. Fifteen cases occur in our series. History of paroxysmal cough with copious sputum of long duration is frequently a leading symptom. Other lesions dating the onset following a recent acute pulmonary infection may be more confusing. X-ray plates taken after introduction of iodized oil will readily prove the nature of these lesions.

Case History—E. G. was a white woman thirty-seven years old. The symptoms of paroxysmal productive cough, dyspnea, repeated small hemoptyses, marked weakness had been present since influenza six months before admission. There had been several attacks of pneu-

monia during the past ten years. Physical examination: The respirations were rapid and shallow. A postural scoliosis was present. Marked clubbing of the nails of the fingers and toes was noted. Chest signs: Marked hyperresonance lower chest with slight impairment above second rib and fourth dorsal spine. Bronchovesicular breath sounds present over the right upper chest. Breath sounds were obscured elsewhere by moderately coarse rales on quiet breathing. Voice sounds were normal. Many moist rales and rhonchi were heard throughout the chest after cough. A positive skin reaction to .2 mgm. of tuberculin was obtained, negative reactions having been obtained to smaller amounts. X-ray: Slight fibroid and nodular tuberculosis involving the left upper lung, increase in bronchovesicular markings throughout both lungs. This suggests the possibility of a diffuse bronchiectasis, particularly at the bases. Pleurisy, base of left lung. The tuberculosis in the left lung is probably not of recent origin or of present significance and the bronchiectasis is a significant finding on these plates. Admission diagnosis: Chronic bronchiectasis and emphysema. Tuberculosis deferred. The patient rapidly became weaker and died six weeks after admission. Autopsy findings: Marked dilatation of all the bronchioles with considerable exudate in the lumina; pulmonary emphysema; pleural adhesions; peritoneal effusion and cholelithiasis. No tuberculosis was found.

Abscess of the lung has occurred in six cases of our series. A history of tonsillectomy, tooth extraction, or previous pneumonia is frequently obtained from these patients.

Case History—I. B. was a white woman, age twenty-seven who was admitted to the sanatorium on June 8th, 1931. The patient had not been well since childbirth in December, 1929. The following acute symptoms had been present for five months: cough; sputum, approximately one ounce daily; loss of about twenty pounds in weight; repeated small hemoptyses; three attacks of acute pleurisy; anorexia; temperature, 99° to 100.6°. *Physical Examination*—The patient was apparently acutely ill. *Chest Signs*—Right; dullness to fourth rib and sixth dorsal spine with bronchovesicular breath sounds over this area. Whispered and spoken sounds were increased to the third rib and sixth dorsal spine, with marked bronchophony and pectoriloquy near the fourth dorsal spine. No rales were heard. The signs over the left side of the chest were normal. Marked clubbing of the nails was noted. The remainder of the physical examination was un-

essential. X-ray—Parenchymal pulmonary tuberculosis of the pneumonic type involving the right upper lobe with possible cavitation at the level of the second interspace. A few fine fibroid deposits on the left side which do not have the appearance of being a recent type of disease or of present clinical significance. A diagnosis of pulmonary tuberculosis, moderately advanced (b) was made. Artificial pneumothorax was instituted after repeated hemoptyses of four and five ounces. In spite of a good collapse of the involved lung the symptoms were not controlled; the temperature became of septic type and increased to 103° and the cough was extremely troublesome. At this time, a cause other than tuberculosis was suspected. On questioning the patient, the fact was ascertained that shortly following tonsillectomy in December, 1930, a large amount of very foul sputum had been suddenly expectorated. Bronchoscopic examination and drainage was performed; the artificial pneumothorax discontinued; and the patient made a rapid recovery. She was transferred to the University Hospital for further bronchoscopic treatments and has since been discharged as cured.

Of the heart lesions, mitral stenosis is most frequently confused with tuberculosis as this valvular lesion is most prone to produce chest symptoms and cause hemoptysis. In the absence of positive findings of tuberculosis the history in such a case together with the findings on physical examination, X-ray and electrocardiogram will ensure the correct diagnosis.

Specimens of tumors of the lung either primary or metastatic may be obtained by means of the bronchoscope. In such a case, diagnosis may be ensured immediately. If the tumor mass is not situated near the bifurcation of the bronchi, this may not be possible. Hemoptysis and pleural effusion may be pronounced with even a small tumor. Following such a case over a long period of time may be necessary before the diagnosis may be assured. Serial X-ray plates are of importance. The shadow of a primary tumor is a dense lesion accompanied by atelectasis. This usually occurs in an upper lobe, but may occur in any part of the lung. Secondary tumors in the lung produce rounded sharply circumscribed shadows. A careful general physical examination will frequently disclose the original tumor mass.

Case History—Primary malignancy of the lung: C. W. was a white man forty-six years of age who had increasing pain in the back with deformity for the past three years. Weakness had progressed until the patient was unable to

walk prior to admission. A diagnosis of tuberculous disease of the spine had been made. *Physical examination*—A small knuckle deformity was present over the twelfth thoracic vertebra. Complete motor and partial sensory paralysis of the lower extremities was present. There were decubitus ulcers over the sacrum and right iliac region; urination and defecation were involuntary. A group of inguinal lymph nodes were palpable on the left side. *Chest*—The signs were normal except for sibilant rales over the right lung posteriorly. *X-ray*—Slight amount of fluid base of left lung, two small metastatic nodules left lower lobe. (These plates were taken three months after admission). The patient gradually weakened and died three months after admission. *Autopsy Findings*—Primary carcinoma of the left bronchus with metastases to lumbar lymph nodes, spinal nerves, left kidney and duodenum; chronic pulmonary tuberculosis and tuberculous lymphadenitis (the tuberculous lesion was very small and inactive). The remainder of the autopsy findings were unimportant for this report.

Case History—Metastatic malignancy of the lung: J. L. was a white man, forty-eight years of age. Injury had occurred to the left testicle three months before admission. Shortly after this time further symptoms developed; chest pains, weakness, rapid loss of sixty pounds in weight, dyspnea, anorexia and vomiting, slight cough with slight sputum, hoarseness and insomnia. *Physical Examination*—The respirations were rapid and shallow. *Chest*—Percussion note was impaired over the anterior chest, flat over the back. Breath sounds were of bronchovesicular character throughout. Tactile fremitus was increased throughout. Increased whispered voice sounds were heard above the clavicle on the right and above the second rib on the left side. Superficial rales, not increased after cough, were heard over the entire chest more marked on the right side. There was a small area of moderately coarse and coarse rales in the first interspace on the right side. *Lymph Nodes*—Left cervical and supraclavicular and left inguinal nodes were enlarged to about two cm., were very hard but movable. *Abdomen*—Marked tenderness over left upper quadrant. The liver was palpable three cm. below costal margin in the mid-clavicular line. The left testicle was much enlarged and firm. A decubitus ulcer was present over the sacrum. *X-ray*—Extensive rounded sharply circumscribed lesions, metastatic tumor involving both lung fields completely obscuring the heart shadow. This lesion has all the characteristics of metastatic teratoma. The patient died six days

after admission. *Autopsy Findings*—Teratoma of left testicle with metastases to retroperitoneal and mediastinal lymph nodes and lungs.

The remaining lesions mentioned in the table occurred infrequently in our series of non-clinical and non-tuberculous cases. Various procedures were carried out as were indicated by each individual case.

It is frequently a tedious and time consuming task to arrive at the final diagnosis, in many cases requiring hospital or sanatorium care to facilitate observation and special procedures that would be impractical or impossible in the home.

TUBERCULOSIS IN CHILDREN—WITH A CASE REPORT

P. M. MATTILL, M.D.

The subject of tuberculosis in children and its relation to tuberculosis in adults is one of never waning interest. Perhaps at no time has as much been said and written on the subject as now. To attempt, then, to adequately discuss the subject in the time allotted me would not be possible. I shall therefore confine myself to a few brief remarks on first infection and re-infection as it relates to children, with the presentation of the findings in one case.

The anatomical picture of first infection is well known, largely due to the brilliant researches of Anton Ghon. The correlation of the anatomical with radiologic findings by Opie has done much to establish a standard for diagnosis by means of the X-ray. The examination of school children on a large scale with the X-ray examination of the chest of all those reacting positively to tuberculin has thus a firm foundation on which to build.

All children who react positively to tuberculin have been infected with the tubercle bacillus, but probably not more than 25 per cent of those infected will give any evidence of such infection when an X-ray film is taken. This may be due either to the fact that the lesion is unfavorably located or that it is too small to be visualized. It is now generally accepted that 90 to 95 per cent of all first infections occur in the lung so that it will be seen that the X-ray film of the chest is of greatest value in studying these cases.

The typical lesion of first infection is usually a small subpleural caseous nodule which, combined with the regional or related lymph nodes, makes up the Primary Complex of Ranke. In about ten days to three weeks following first infection, the body becomes hypersensitive or allergic to the tuberculo-protein and as a result

we may have a more or less extensive collateral inflammation surrounding the focus and the lymphatics which lead to the regional nodes. There is a marked tendency for this inflammatory exudate to be absorbed. The end result is usually calcium deposits in the primary focus and related nodes but there may be healing by fibrosis only.

This tendency for the body to localize the first infection and for it to go on to healing is particularly marked in the children in the five and ten year age group. Infection seems to be somewhat less well tolerated in early life, particularly in infancy. While the prognosis in infancy is not as grave as was formerly taught, there is still a very considerable mortality during the first year of life and if this mortality in infancy is considered in relation to the percentage of those infected, then the mortality in infancy would still exceed that of any other age period.

Ranke¹ in the formulation of his ideas of the three stages of tuberculosis pointed out that not all primary foci heal; that there was in these cases a tendency for generalization. Two things particularly characterize this stage; first, hematogenous metastases and second, increased exudative reaction about the primary focus. This exudative reaction may be accompanied with rapid caseation, softening and cavity formation. Following the formation of cavity, caseous material could enter the bronchi and spread into

other parts of the lung; it could also be coughed up and swallowed, thus carrying infection to the intestine.

I wish to present briefly a case which I think represents the stage of generalization following first infection—in other words, it is a case in which the infection did not remain confined to the primary complex. This child was admitted to the sanatorium at the age of 15 months with the history of having been ill since nine months of age. We were able to confirm the diagnosis of tuberculosis by obtaining a positive tuberculin reaction, by the presence of an X-ray lesion, and recovery of acid fast bacilli from the sputum by means of a throat swab. Later tubercle bacilli were found in the urine, stools and in the discharge from the ear. The child was critically ill on admission, the clinical course was unfavorable and death ensued with a terminal meningitis.

The X-ray picture (Plate I) shows an extensive involvement which has an appearance somewhat resembling encapsulated fluid, also there are mottled areas in the lung which were thought to represent miliary tubercles. The autopsy examination showed that there was involvement of practically the entire right middle lobe (Plate II) of the lung with caseation throughout. Miliary tubercles were present in the remainder of both lungs. The tracheo-bronchial nodes were enlarged, particularly those in relation to the right

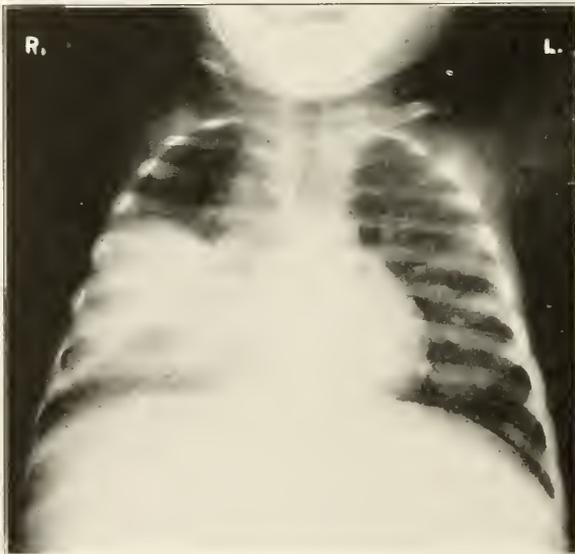


PLATE I

R. G. B. No. 4989—X-Ray Film of Chest
Density over base of right lung having the appearance of encapsulated fluid. Fine granular mottling, miliary tuberculosis, throughout the remainder of both lungs.



PLATE II

R. G. B. No. 4989—Section of Right Lung
A. Bronchus. B. Caseous lymph node. b. Lymph node with tubercles. C. Middle lobe—caseous tuberculous mass. D. Upper lobe—scattered miliary tubercles. E. Lower lobe—scattered miliary tubercles. F. Diaphragmatic surface.

middle lobe. There was a generalized tuberculosis with involvement of the middle ear, meninges, spleen, adrenals, peritoneum, kidneys, and there was a tuberculous ulceration of the bowel.

The lesion in the right middle lobe is, I think, without question the site of the first infection and I think this view is confirmed by the presence of the large tracheo-bronchial node adjoining. This case further, I believe, represents a case of first infection that did not remain localized. Instead, we have hematogenous metastases with involvement of the kidneys, adrenals, meninges, etc. The ulceration of the bowel is most probably secondary infection from swallowed sputum. The massive caseation of the middle lobe, I believe represents a progressive stage of the exudative reaction that occurs around the focus of first infection, when the tuberculosis is progressive as it was in this case.

Factors which may favor progressive disease following first infection are resistance and dosage. Infants seem to be able to localize the first infection somewhat less easily than older children either because of less native resistance or because acquired resistance develops more slowly. The dosage is probably of more importance. Massive infections occur which do not remain localized to the primary complex. Generalization follows and when extensive as in this case, death results.

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TUBERCULOSIS IN NORTH DAKOTA AND WHAT IS TO BE DONE ABOUT IT

(Continued from Page 179)

sides these whom the doctors think we can help them with, we want these also.

"The chief work of the Traveling Clinics is to follow back along the trails that tuberculosis has left behind it.

Yours fraternally,"

We recommend that in North Dakota such a plan be instituted in connection with our State Sanatorium. This can only be done by having a permanent head of the Sanatorium who is familiar with all phases of the situation at all times. It means taking the superintendency of the institution out of politics. It also requires co-operation between the existing agencies, the Sanatorium Staff, the State Health Department, and the North Dakota Tuberculosis Association, with a readjustment of their activities which will avoid duplication of effort. It means, also, more hearty co-operation of the medical profession with the people and these agencies, and vice versa.

We wish to express our thanks and appreciation for their assistance in making the records of their activities available and for their co-operation and suggestions, to Miss Helen Katen, Secretary of the North Dakota Tuberculosis Association; Dr. A. A. Whittemore, State Health Officer; Dr. Charles MacLachlan, Superintendent of the State Sanatorium, and Dr. D. A. Stewart, Superintendent of the Manitoba Sanatorium, Ninette, Manitoba.





The JOURNAL LANCET

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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' Assn.
Great Northern Railway Surgeons' Assn.
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1933 TUBERCULOSIS SPRING EDUCATION CAMPAIGN

The annual Early Diagnosis Campaign, conducted on a nation-wide scale by the 48 states and most of the 2084 affiliated local tuberculosis associations, has been called "The greatest health education campaign in the United States." While these campaigns were intended originally to last for one month only, and were undertaken to meet the request of state and local secretaries for a method of focusing public attention on some definite phase of modern tuberculosis knowledge, they have proved so popular and so effective that they are now conducted as year-round efforts by many associations.

The plan began in 1928 with the theme expressed by the slogan "You May Have Tuberculosis, Let Your Doctor Decide." In 1929 practically the same idea was again brought to the attention of the public under the slogan, "Early Discovery—Early Recovery." The following year, in line with the latest advances in knowledge about the disease—that future cases of active tuberculosis develop from the early latent form now known as the "childhood type"—the slogan was, "Protect Them (Children) From Tuberculosis." This campaign, which featured the appealing picture of a healthy golden-haired child on all posters and literature, proved the most successful up to that time. In 1931 the

campaign was directed to the "high school age" group of boys and girls—and to their parents also, with the slogan, "Tuberculosis, the Foe of Youth."

Having, presumably, acquainted each age group throughout the country with the latest knowledge about tuberculosis and having explained carefully in non-technical language just how the disease may be manifest in each group, it was decided that the next step should be to stress, and knit still closer, the machinery by which cases of tuberculosis may be found. The 1932 campaign was carried out along this line. The slogan stated succinctly and clearly the thought the campaign wished to emphasize, "Tuberculosis Causes Tuberculosis—Every Case Comes from Another."

Beginning April 1, 1933, this work will be continued with an intensive campaign emphasizing again the communicability of tuberculosis, with the slogan: "From Whom Did He Get It?—To Whom Has He Given It?" No doubt as in the past this campaign will increase the interest of the public in tuberculosis control and will bring to the physicians of the country large numbers of patients for diagnosis and advice. This special tuberculosis issue of THE JOURNAL-LANCET is an attempt to aid the National Tuberculosis organizations in the northwest in the 1933 spring education campaign.

J. A. M.

LIEN LAWS AGAIN

When the editorial on Lien Law in Accident Cases was written a month ago, we had no idea that so much misinformation could come from apparently reliable sources.

In the first place, Dr. A. F. Branton of Willmar is chairman of the legislative committee of the Minnesota Hospital Association, and in the second place, we learn that the bill in question never was referred to the banking committee. So much for that.

Physicians as hospital staff members were circularized in support of the hospital bill and their natural reaction was that of "the forgotten man," hence our editorial. We have now most reliable information, verified by both hospital and medical groups, that this matter has been fully discussed in joint committee, and it has been decided to support the hospital bill at present without including the doctors as such. Dr. Woodward, Director of the Bureau of Legal Medicine and Legislation of the A. M. A. is making a study of the whole matter for the purpose of drafting an effective bill for physicians. The legislative committee is right in waiting for that report. In the meantime nothing will be lost by supporting this measure, and incidentally, there is some advantage for the medical claimant in having the proposed records on file in the register of deeds office.

A. E. H.

TUBERCULOSIS CONTROL IN NORTH DAKOTA

The article by Dr. Arnson in this number of THE JOURNAL-LANCET is particularly significant in that it comes from a private practitioner. Men in practice with such a view point have been quite rare in the past. Obviously, Dr. Arnson has an up-to-date vision of tuberculosis control. He knows the total number of reported cases in North Dakota and the relatively small number of sanatorium beds; he appreciates the great value of the sanatorium organization. In his program he also includes the practitioners of medicine and the private hospitals throughout the state and recognizes their potentialities in tuberculosis work; in short, his program is state-wide. This is in line with the program of such states as Massachusetts, North Carolina, and Tennessee, and must be the program of every state before tuberculosis has been brought to an irreducible minimum.

The veterinarians had such a vision about two decades ago and their accomplishments of today prove that their vision was clear. North Dakota

is one of the states which has been so remarkably benefited by the control of tuberculosis in animals. Its girls and boys are now quite well protected against the bovine type of tubercle bacillus from which so many suffered a generation ago. Therefore, the Live Stock Sanitary Board of North Dakota has made the problem of tuberculosis control in the human family much easier than it would have been even a decade ago. If the medical profession will catch the vision with Dr. Arnson and other outstanding physicians and health workers in the state of North Dakota, and will follow through, the disease in the human family will be brought under control very rapidly. To be sure, it will require a longer time to teach, isolate, and treat the human spreaders of tubercle bacilli than it did to slaughter the animal carriers, both actual and potential. However, this is well within the realm of physical possibility.

It is gratifying to find that throughout the country there is a great awakening on the part of physicians with respect to the diagnosis, treatment and prevention of tuberculosis. The present decade may well be called the Renaissance in tuberculosis.

J. A. M.

SYMPOSIUM ON TUBERCULOSIS

THE JOURNAL-LANCET is pleased to present to its readers a symposium on tuberculosis by the Glen Lake Staff, which was presented before the Hennepin County Medical Society on February 1, 1933. This symposium constituted one of the best programs of the Society this year, since the papers were concise and contained much practical material.

The changing attitude concerning the co-existence of pregnancy and tuberculosis is clearly presented and conforms with the viewpoint of a number of obstetricians and tuberculosis workers in various parts of the world. Pregnancy does not have such a deleterious influence on tuberculosis as we formerly believed.

The detection and treatment of pulmonary cavities, as well as their danger to the patients and their associates, are adequately presented. Not long ago we believed that cavities in the lungs could always be detected by physical examination. Postmortem studies, as well as X-ray observations, have proved beyond doubt that many cavities are not found by physical examination alone. Such workers as Probst, Heagey, and Barnes, have called attention to the fact that the medical treatment of cavity cases is not very efficacious; in fact, cavities often make their appearance while the patients are on

the very best medical treatment, including strict bed rest. These facts are among the best arguments for collapse therapy. When instituted before cavities appear, it may prevent their development. When cavities are already present, collapse therapy frequently results in their obliteration.

Differential diagnosis has been greatly facilitated by special diagnostic aids in recent years. Instruments such as the bronchoscope and microscope aid a great deal in arriving at diagnoses of conditions which were formerly diagnosed as tuberculosis. Among them is primary carcinoma of the lung. Not infrequently one finds institutions for the treatment of tuberculosis where as many as 20 per cent of the patients are non-tuberculous. The subject of differential diagnosis is discussed most effectively in this symposium and it is gratifying to learn that only 8.68 per cent of 1,279 patients discharged from the Glen Lake Sanatorium in the past three years had either non-clinical tuberculosis or no tuberculosis.

Tuberculosis in children has attracted widespread interest in the past ten years. There are still a few points of controversy in this field but they are of little significance. Those workers who have had considerable experience with the subject are in agreement on the major points. The modern viewpoints are clearly presented in this symposium. Other subjects of great value to the clinician are also adequately discussed.

As an institution for the diagnosis and treatment of clinical tuberculosis, the Glen Lake Sanatorium stands in the front line. This statement is attested by the papers prepared by its staff members and presented as a symposium in this issue of THE JOURNAL-LANCET.

J. A. M.

DOCTOR JOHN W. BELL 80

Many fellow members of the profession remembered Dr. John W. Bell with flowers, tele-

grams and letters of congratulation on the occasion of his eightieth birthday, March 18th.

It is timely that mention should be made of the fact in this issue of THE LANCET, devoted as it is to tuberculosis, because he was an outstanding pioneer in that field in the northwest.

The tribute we would bring, however, is not so much because of any special line of endeavor, but rather because he has so beautifully exemplified the beloved physician. As teacher, counselor, physician and friend, he has influenced the lives of many, and they have testified to his kindly interest and his sympathetic understanding. His tranquil proximity in crises or grave emergencies has ever been a comforting assurance against panic and has mitigated fear. His approach to the sick-room has been like footsteps upon the wool and his presence a benediction.

And so, to this valiant medical chevalier, who has served mankind *sans peur et sans reproche* more than fifty years, we take this means of expressing our felicitations. Laurel leaves, applause and thanks; and we shall always be glad that you were born.

A. E. H.

LETTER RECEIVED FROM DR. BELL

Editors of THE JOURNAL-LANCET,

Dear Doctors:

I am inexpressibly touched and gratified by the two hundred and more greetings for my eightieth birthday received from my colleagues in medicine, from former students, and friends not in medicine.

I would like to respond, individually, but must ask "THE LANCET" to act for me and give you each my affectionate thanks.

Your old friend,

JOHN W. BELL.

Proceedings Minnesota Academy of Medicine

January 11, 1933.

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, January 11, 1933. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. C. D. Freeman. There were 29 members and guests present. The business meeting was omitted and the

scientific meeting consisted of the president's address.

DR. J. C. LITZENBERG (Minneapolis) as retiring president gave his address entitled "The Status of Obstetric Practice in Minnesota." Numerous lantern slides of charts were shown.

The meeting adjourned.

R. T. LA VAKE, M.D. *Secretary.*

February 8, 1933.

THE regular monthly meeting of the Minnesota Academy of Medicine was held on Wednesday evening, February 8th, 1933, at the Town & Country Club. Dinner was served at 7 o'clock, and the meeting was called to order at 8 o'clock by the President, Dr. C. D. Freeman. There were 32 members and two visitors present.

Minutes of the December and January meetings were read and approved.

A motion was carried that Dr. John W. Bell,

of Minneapolis, a past president of the Academy, be made an Honorary Member.

DR. F. E. B. FOLEY (St. Paul) read a paper entitled "The New Surgery of Bladder Neck Obstruction," instruments, methods, and review of cases. Illustrated with lantern slides.

Owing to the lateness of the hour, Dr. W. H. Condit's paper on "Trichomonas Vaginalis" was postponed to the next meeting.

The meeting adjourned.

R. T. LA VAKE, M.D.
Secretary

Proceedings Minneapolis Clinical Club

Meeting of February 9, 1933

THE regular monthly meeting of the Minneapolis Clinical Club was held in the Lounge of the Medical Arts Building on Thursday evening, February 9, 1933. The meeting was called to order by the President, Dr. Archie H. Beard, at 7:15 P. M.

After the business meeting, during which officers were elected for the year 1933-34, the following scientific program was given:

Inaugural Dissertation: The Growth of the Human Female Pelvis from Birth to Maturity (A Graphic and Quantitative Study), Dr. Roy E. Swanson.

Inaugural Dissertation: Treatment of Fractures of the Clavicle, Dr. Myron O. Henry.

THE GROWTH OF THE HUMAN FEMALE PELVIS FROM BIRTH TO MATURITY A GRAPHIC AND QUANTITATIVE STUDY

ROY E. SWANSON, Ph D., M.D.

A careful study of the human female pelvis, from the standpoint of growth, is undertaken in this project, by means of certain external body measurements. These data were treated by graphic and quantitative methods, in common use today.

The need of such a study is obvious from a perusal of the literature and it is a continuation of the morphometric studies started at the University of Minnesota by Prof. R. E. Scammon ('15)

The few growth measurement studies of the pelvis recorded in the literature have been made mostly in foreign countries and are not entirely applicable to the American population. In many, if not all instances, the conclusions have been based on an unrecorded or insufficient number of cases. They rarely cover the complete age interval from birth to maturity and have not received the analytic treatment that the subject deserves.

Quetelet ('70) is said to have based his curves and

tables on ten cases per year, with no exact age specified in the groups. He treated his curves in some unexplained way that makes their value questionable. Konikow ('93) based his conclusions on three cases per year with none of the exact ages specified. Klein ('96) bases his figures on from five to eleven cases per year with exact age and race not specified. Hastings ('02) in America published his work on boys only.

This study is based on measurements of 30 individuals in each year group, and specifies age in years, months, and days and includes a total of 660 healthy Caucasian females from birth to 21 years. All measurements are recorded in centimeter and millimeters. An attempt was made to treat this data in a comprehensive statistical way, graphically and quantitatively.

I wish to thank Prof. R. E. Scammon for his active guidance, supervision and instruction in the handling of this data.

A large number of body measurements, all taken by the author in a uniform manner, with standard accurate instruments were taken. Only the following will be discussed in this paper:

- 1—The interspinous diameter (I. S.).
- 2—The intercrystal diameter (I. C.).
- 3—The intertrochanteric diameter (I. T.).
- 4—The external conjugate diameter (E. C.).
- 5—The right and left obliques (R. O., L. O.).

The analysis of this data was for the following purposes:

- 1—To secure a concept of the mean growth of the pelvis in post natal life with respect to time.
- 2—To secure a concept of the variability of the pelvis in post natal life with respect to time.
- 3—To secure some concept of the mean growth and variability of the external pelvic dimensions with respect to time in this period.
- 4—To obtain a concept of the rates of growth of the various external pelvic dimensions.

The data was treated in the following manner:

- 1—The arithmetical average, the maximum and mini-

mum and the range was obtained in each year group.

2—Scatter graphs were made using each individual measurement plotted as ordinate against both age and body length as abscissa.

These graphs show the scatter of cases and the general tendency of the distribution.

3—Average yearly point to point curves were now drawn, using the arithmetical averages per year as ordinate against age as abscissa.

4—The averages were now smoothed by the three-point method of the moving average. This procedure removed the irregular jumps in the curve and does not effect the value of the curve. These new values were now graphed on the curves of the unsmoothed averages to age and from this a curve of inspection was drawn by means of a ship rule. This brought the yearly periods of growth into parabolas as they probably are in nature.

5—The average deviations, the per cent average deviation, the mean square deviation, the probable error of the average and the coefficient of variability were all worked out according to these formulae:

$$A. D. = \frac{\text{sum of deviation}}{\text{number of observations}}$$

$$\% A. D. = \frac{A. D. \times 100}{\text{average}}$$

$$M. S. D. = \frac{\sqrt{\sum d^2}}{N}$$

where $\sum d^2$ equals the deviate squared individually and totaled, and N equals the number of observations—

$$P. E. (\text{Probable Error}) = \frac{M. S. D. \times 0.6745}{\sqrt{N}}$$

where M. S. D. is the mean square deviation, 0.6745 is a constant and N the number of observations.

$$(\text{Coefficient of Variability}) C. V. = \frac{M. S. D. \times 100}{M}$$

where M. S. D. is the standard deviation, M the average and 100 the means of converting it to per cent.

6—From the curves of inspection, new end year values were obtained by interpolation. From this the absolute yearly growth, which represents the absolute increments in stated intervals were obtained. These figures were converted into per cent increments which give the increment in per cent in stated intervals.

7—In order to properly compare the postnatal growth of the various pelvic dimensions, it was necessary to bring them to a common scale. This was done by subtracting the birth value from the adult value, giving the total postnatal amount of growth. The attained per cent of growth at any end year period could now be obtained.

A large amount of data was obtained in this study. In this report only the growth of the various pelvic diameters with respect to age will be considered. The accompanying graphs, curves and histograms support the following conclusions:

1—The curves of growth of the various pelvic diameters

show the typical four phases of post natal growth.

2—The interspinous diameter a little more than trebled its birth value on reaching adult size. It reached its adult size by the eighteenth year.

3—The intercrystal diameter almost quadrupled its birth value on reaching adult size in the seventeenth year.

4—The intertrochanteric diameter increased its birth value three and one-third times on reaching its adult size in the seventeenth year.

5—The external conjugate diameter in its early phase of rapid growth lagged behind all other measurements. It showed the phases of growth rapid from birth to two years, slow from two to ten years, rapid from ten to the fifteenth year and slow from the fifteenth to the twenty-first year. This measurement doubled by the third year; trebled by the fourteenth and was three and one-half times birth size in reaching maturity by the seventeenth year.

6—The right and left oblique diameters show the typical four phases of post natal growth. It doubled its birth value in the third year; trebles it by the thirteenth year and reaches adult size in the sixteenth year, increasing about three and one-half times. The right always exceeds the left oblique throughout the series.

7—The phases of rapid growth in the pelvic diameters studied, were between one and five years, and eleven and sixteen years.

8—All the pelvic measurements studied except the intercrystal and intertrochanteric, have practically reached adult size in the sixteenth year. The two exceptions reached maturity in the seventeenth year.

9—The field graphs revealed a distribution of cases consistent with the law of chance selection.

Approximately 20 graphs, curves and histograms as lantern slides showing—

1—Scatter graphs.

2—Average point and smoothed curves.

3—Per cent attained growth.

DISCUSSION

DR. J. C. LITZENBERG: I shall leave the statistical handling of this subject to Dr. Boyd who sleeps statistics, eats statistics, lives statistics and is statistics!

I got quite a kick out of Dr. Swanson's handling of the problem. It took me back to a Sunday afternoon at Alexandria, Minn., where I was vacationing and I sent for the country doctor out there who I had known as a very bright young student, and had him come out and spend Sunday afternoon with me. I had a talk with him about his "wasting his sweetness on the desert air" and laid before him the problem or the possibility of giving up his lucrative country practice and coming as a Teaching Fellow to the University at \$600 a year. That looked awfully small to him but I said, "Think it over." He thought it over and here he is tonight. I have no little feeling of pride in his paper.

There is one phase in the "Development of the Pelvis" that rather pleased me because it adds statistical evidence to clinical observation. For a number of years it was thought that the young woman in her

teens had a very hard and difficult labor because her pelvis was not developed. It was considered not large enough. It reaches its maximum growth, according to these statistics, at from 16 to 18 years. It averages about 17 years, I believe. It just shows how careful clinical observations are so often borne out by subsequent elaborate scientific or statistical study.

I have always had great admiration for some of the old clinicians who told us things that afterward were proved in the laboratory to be true. They told us that the blood volume was increased. They didn't call it increased blood volume, but hydraemia. Scientific investigation has borne that out. How did they do it? By careful clinical observation and deductive reasoning.

The old idea that the young woman had a hard labor because her pelvis is not fully developed until later years was proved to be erroneous and the young primipara in her teens does not have any harder labor than her sister in the twenties. Here we have the investigator telling us why. From the practical standpoint, that is the most interesting finding in the analysis. To Dr. Boyd, of course, these figures will mean a very great deal more.

I want to thank Dr. Swanson for giving me the privilege of hearing him. I came here to enjoy myself and I never enjoy myself unless I can talk. I am like a patient who had a baby last week. When she was coming out from the gas she said:

"Is my baby born?"

"Yes."

"What is it?"

"A boy."

"Thank you very much, I've had a very pleasant evening."

DR. EDITH BOYD: Dr. Swanson's findings that the female pelvis reaches its adult size by seventeen years instead of the older figure of twenty or more fits in with other interesting phenomena of human growth. American, English, Swedish and German data show that both men and women are increasing in average height, and that adult height is reached at an earlier age. For instance, Boyle has demonstrated that the "Harvard" sons of "Harvard" fathers are both taller and younger at the time of entrance into college than the fathers. The same is true of the daughters and mothers who have attended several eastern women's colleges. Also there is practically no increase in height among college students after the freshman year. Dr. Swanson's findings are a part of a general shift in the pattern of growth of the human body.

Dr. Swanson has asked me to explain some of the statistical constants used in his report. This is impossible to do in a few minutes, however, a few points may be brought out. The standard deviation, or δ , used by Dr. Swanson indicates that the middle two-thirds of the measurements of a given pelvic dimension fall within plus or minus one standard deviation of the mean. For instance, if for a given age the mean dimension is 20 cm. and the the standard error 2 cm., two-thirds of the women would have measurements

falling between 18 and 22 cm. Ninety-five per cent of the women would have measurements falling within plus or minus two standard deviations, or 16 to 24 cm.

In the literature today you commonly see a column headed

Mean \pm its standard error

or

$M \pm \delta$

m

with some numbers such as $20 \pm .2$ cm. written under it. This indicates that two-thirds of the means of a series of similar samples would fall within plus or minus one standard error from the observed mean, and ninety-five per cent within plus or minus two standard errors from the observed mean. The standard error of the mean is equal to the standard deviation or δ , divided by the square root of the number in the sample. When a second mean is beyond the range of plus or minus two standard errors of the observed mean, we assume it probably came from a different population, since such a mean would occur for only five of a hundred samples from the same population.

Some authors use the mean plus or minus the probable error of the mean, which as Dr. Swanson stated is merely .6745 times the standard error of the mean. In that case one-half of the means of a series of samples would be expected to fall within plus and minus one probable error of the observed mean, and ninety-five per cent would fall within plus and minus three probable errors of the mean. Some reports do not indicate whether the author used standard error or probable error, which is confusing. However, the probabilities from which the significances of differences between two means is judged are the same regardless of which constant is used, namely that such a difference could occur by chance alone only five or less times in a hundred.

I would like to point out that the physician uses the principle of probability which underlies statistical interpretations whenever he gives the prognosis of a case. For instance, if a serious complication is known to occur in about five per cent of the cases of a given disease, you give a good prognosis to the patient, but if it occurs in fifty per cent of the cases, you give a more guarded prognosis.

DR. R. T. LAVAKE: It is very important to have such convincing proof that girls at this comparatively early age, namely 17, are in perfect condition to bear children, from the standpoint of pelvic measurements. I can add nothing in discussion to this convincing paper but I am pleased to have the opportunity of congratulating the essayist on his excellent work.

DR. E. T. EVANS: I think some of this work is most interesting because it does bear our clinical observations which we have made in structural scoliosis. If we go to the embryologist we will learn that the pelvis is, after all, the glorified transverse process of the vertebral body. Our clinical observations of the scoliosis show that in the female the maximum curvatures which represent the full osseous development of the bodies, have occurred, as a rule at from 16 to 17 years of age and this clinical observation is substantiated by the

present paper. This is especially true in the southern races. In the northern races, the average full osseous development is from 17 to 19 years of age according to our clinical observation. It might be interesting to know what the ratio deviations in this paper are,—whether or not the Anglo-Saxon has a little retardation as compared to the southern European.

DR. WALTER FINK: In a slender woman does the rate of growth vary very much from the heavier set person and did Dr. Swanson take this into consideration in making these measurements?

DR. ROY SWANSON: Answering Dr. Fink, in this study I have only reported on growth with respect to age. I have also graphed all these measurements against both standing and sitting heights. The tall female was included in this study.

In answer to Dr. Evan's question regarding race in this study, the greatest number of pure stocks were English, Irish, Scotch, Norwegian and Swedish, and this fact might explain the retardation in the Anglo-Saxons over the south European race.

AN IMPROVED CLAVICLE SPLINT

MYRON O. HENRY, M.D.

Minneapolis

Summary—The adjustable splint presented herewith has been devised by the author to fulfill the traditional requirements of lifting the shoulder upward and backward, and the modern requirements of correction of shortening and freedom of the joint of the arm. It maintains elevation of the shoulder from the pelvis, according to the orthopedic principles laid down by Lovett. It is not uncomfortable and permits the patient to be ambulatory fully dressed. The students, whose fractured clavicles have been treated in this splint, have continued their classes without loss of more than one day, and they have gained perfect functional results. The free use of the arm permitted by the splint prevents atrophy and stiffness, thereby eliminating massage, physiotherapy, and other subsequent treatment. Acromio-clavicular dislocations, either complete or partial, can also be treated efficiently in this splint.

DR. WILLARD WHITE: I enjoyed this demonstration very much. I would like to ask Dr. Henry a question. When you use the Boehler splint do you use it as is or the metal band attached to it for the purpose of binding it to the chest wall?

DR. MYRON HENRY: I do not like the metal bands for children. I use the splint with the webbing. The Boehler splint is a cumbersome affair. On account of the metal strips it has to have so much padding.

DR. ORWOOD J. CAMPBELL: There is a slot with a set-screw here at the side whereby the splint may be rotated with respect to the pelvic support in order to throw the shoulder back. I am wondering how this position can be maintained with such a small pelvic support. Possibly if the support were larger and

grasped the pelvis more firmly it would be easier to maintain this position.

DR. MYRON HENRY: This is the first one that has been made and of course it would work better if the model were 20 pounds lighter. It would have to fit properly.

DR. E. T. EVANS: I have been wearing this for one and one-half hours and I told Dr. Henry when I started to wear it that I thought it would be more comfortable if my clavicle were fractured, but it really isn't so bad.

The question of fractured clavicles has always been a difficult one. So much so that we will ride along on our so-called reputations—and put it up to the female patients, do you want complete reduction or do you want to use your arm? In female patients we have been putting them up in plaster spicas, thus holding our reduction. The spica is, for a simple fracture, a terrible thing to wear. I have seen a modified clavicular cross cut through the whole shoulder anteriorly with resultant sloughing of the pectoralis muscles.

I have one change which might be worth while,—that is, this cuff holds the opposite shoulder backward and helps hold the full posterior position of both shoulders. It does, however, cut, somewhat, anteriorly, and a strap running obliquely downward from the inferior angle of the cuff to the pelvic support, would relieve a little pull at this point. At the same time it would tend to draw the whole splint backward as well.

DR. ROY SWANSON: I would like to ask Dr. Henry what is the best method of treatment of fractured clavicle in the newborn?

DR. MYRON HENRY: There is no question but what flannel bandage is all that is needed. They are kept recumbent anyway.

The fracture of the clavicle disturbs a lot of people because the appearance is not always satisfactory. Occasionally we get non-union.

I find many of the general men are prone to open up these non-unions. Almost all I have seen of the open reductions have ended up disastrously.

Here is an X-ray picture of a girl who had a fractured clavicle, treated with the external dressing and sling, and a non-union obtained. The doctor opened it and got more non-union. Here she is after the first operation, some months after the original injury. Another operation on September 3, 1931, and October 20, 1931. I operated upon her and did a bone graft in April, 1932. Here she is now, (showing X-ray pictures). All that work, I think, was unnecessary and had to be done because open reduction was attempted on the third day after the fracture.

DR. E. T. EVANS: I operated on a patient the other day who had had three previous operations elsewhere, resulting in non-union. I did the first bone graft at this time and hope it holds.

The Meeting adjourned.

Respectfully submitted,

DR. J. K. ANDERSON,
Secretary pro tem.

SOCIETIES

MINNESOTA STATE MEDICAL MEETING

A unique program has been arranged by the Committee on Scientific Assembly for the 80th Annual Meeting of the State Association scheduled at Rochester, May 22, 23, and 24.

Other items of major interest on the scientific program will include:

Nine special programs arranged by the following special societies: Surgical, Orthopedic, Neurology, Pediatrics, Ophthalmology and Otolaryngology, Heart, Trudeau, Radiological, and the Department of Obstetrics and Gynecology, University of Minnesota. These programs will occupy the whole of Monday, together with the table demonstrations.

The radiotherapy and physiotherapy demonstration under the direction of A. U. Desjardins, Rochester, which is expected to attract especial interest, since a demonstration of the scope of this one is practically without precedent at any medical meeting.

A Symposium on Emergency Surgery has been arranged to take account of all of the commoner surgical emergencies confronting the general practitioner. Farm accidents; automobile accidents; industrial accidents; emergency surgery of the abdomen; emergency surgery in infants and children, and strangulated hernia are among the subjects.

A timely symposium on Nutritional Disorders is also to be a headliner on the scientific program. Skin manifestations; eye manifestations, systemic manifestations of avitaminosis; treatment of malnutrition in adults and vitamin deficiency in children, will be covered by this symposium.

The scientific Cinema will be shown at specified hours on Tuesday and Wednesday. Among the films of unusual interest are "Repair of Hernia with Living Suture," Dr. J. C. Masson, Rochester; "Gait in Nervous Disease," Dr. J. C. McKinley, Minneapolis.

Tuesday afternoon's clinics will be conducted by Dean Lewis of Baltimore, president of the American Medical Association; Drs. E. S. Judd, Rochester; H. L. Kretschmer, Chicago; Irving McQuarrie, Minneapolis; A. W. Adson, Rochester, and F. J. Hirschboeck, Duluth.

Distinguished guest speakers for the meeting will include, besides Dr. Lewis and Drs. Kretschmer, James Ewing of New York, Philip C. Jeans of Iowa City, and Walter Simpson of Dayton, Ohio. Dr. Lewis will conduct a clinic on fractures; Dr. Ewing will talk on Malignancy on Wednesday; Dr. Kretschmer will conduct a clinic on urology; Dr. Jeans will talk on Vitamin Deficiency in Children in the course of the Symposium on Nutritional Disorders scheduled for Tuesday; Dr. Simpson will talk on Undulant Fever on Tuesday also. Dr. J. H. Peck, Des Moines, president of the National Tuberculosis Association, will talk on Control of Tuberculosis: National and International, on the Trudeau Society program, Monday.

Two evening meetings, Monday and Tuesday nights,

will bring a group of famous speakers together to talk over medical economics, social and scientific problems of the medical profession.

On Monday night, Dr. Morris Fishbein, Chicago, will talk about the "Depression and Costs of Medical Care" with discussion by Dr. C. H. Mayo of Rochester, and other important speakers still to be announced.

Drs. Lewis, and Olin West, Chicago, secretary of the American Medical Association, and N. O. Pearce, president of the State Society, will speak Tuesday night. Dr. W. J. Mayo, Rochester, will preside at this meeting.

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. W. Goldman, Madison, has been appointed official physician for Lake County, S. D.

Dr. C. P. Robbins, well known physician of Winona, Minn., was recently married to Miss Helen M. Defendorf of Ionia, Mich.

Drs. E. M. Morehouse and Geo. E. Johnson have announced the opening of new offices in the Newberry Building, Yankton, S. D.

Dr. J. R. Nannestad, who has been in active practice at Albert Lea, Minn., for many years, was found dead at his office on March 14th.

Larimore, N. D. was unfortunate in the loss of its only hospital recently by fire. All of the patients of the hospital were removed uninjured.

The Minnesota Hospital Association will hold their annual meeting at the Curtis Hotel, Minneapolis, on Thursday and Friday, May 25, and 26th.

Dr. J. E. Hetherington, who has been in active practice for many years at Grand Forks, is now associated with Dr. J. Earl Else, Portland, Orgeon.

Dr. and Mrs. D. C. Rhines, Caledonia, Minn., recently celebrated their golden wedding anniversary. Dr. Rhines is one of the oldest practitioners in Minnesota.

The Shrine Hospital for Crippled Children in Minneapolis, was bequeathed \$10,000 by the late Mr. E. A. Gowan, a resident of that city, who died recently leaving an estate of \$100,000.

Dr. R. B. Kettlewell has purchased the practice of the late Dr. R. H. Sweetman, at Sauk Center,

Minn., and is already located in his new offices. Dr. Kettlewell was a graduate of the University of Minnesota.

At the March meeting of the members of the Northwest Medical Society, held at Minot, N. D., the subject of "Puerperal Infection" was discussed by Drs. R. W. Pence, E. M. Ransom and F. E. Wheelon.

The citizens of North Branch, Minn., turned out in a body recently to pay tribute to one of their most beloved physicians, Dr. Thomas Zein, who celebrated his 70th birthday, having been in active practice in that community for the past 43 years.

Dr. J. A. Myers, Minneapolis, was kept busy as a guest speaker at the following societies last month: On March 27 he spoke before the Gibson County Medical Society in Trenton, Tenn.; on March 28 before the Chicago Tuberculosis Institute, Chicago, and on March 29 before the St. Joseph County Medical Society in South Bend, Ind.

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). William A. O. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, was the speaker. The program for the month of April will be as follows: April 5th—Low Blood Pressure. April 12th—When the Baby Cries. April 19th—Family Jaundice. April 25th—Cancer of the Rectum.

Dr. J. W. Bell, for more than 50 years a practising physician in Minneapolis, observed his 80th birthday on March 18th. At his home, came hundreds of letters of congratulation, many of them from members of the profession whom he had befriended and counselled when they were just launching their careers. Dr. Bell began his practice in Minneapolis in 1881. He formerly was a member of the University of Minnesota medical school faculty, and is a former president of the Hennepin County Medical society, the Minnesota State Medical association, and the Minnesota Academy of Medicine.

At the regular meeting of the District Medical Society on March 14, at Watertown, S. D., Dr. H. A. Tarbell was the guest of honor. The occasion being the fiftieth anniversary as a practicing physician for Dr. Tarbell. He was presented with a cake bearing a large lighted candle and a silver vase with the inscription "Dr. H. A.

Tarbell, 1883-1933" to commemorate his fifty years of service as a physician. For the program Dr. C. A. Stewart, Minneapolis, gave a very interesting talk on Tuberculosis which was illustrated with lantern slides, and Dr. A. E. Bostrom, De Smet, of the Department of Health of So. Dakota gave an account of the recent typhoid epidemic at Chamberlain.

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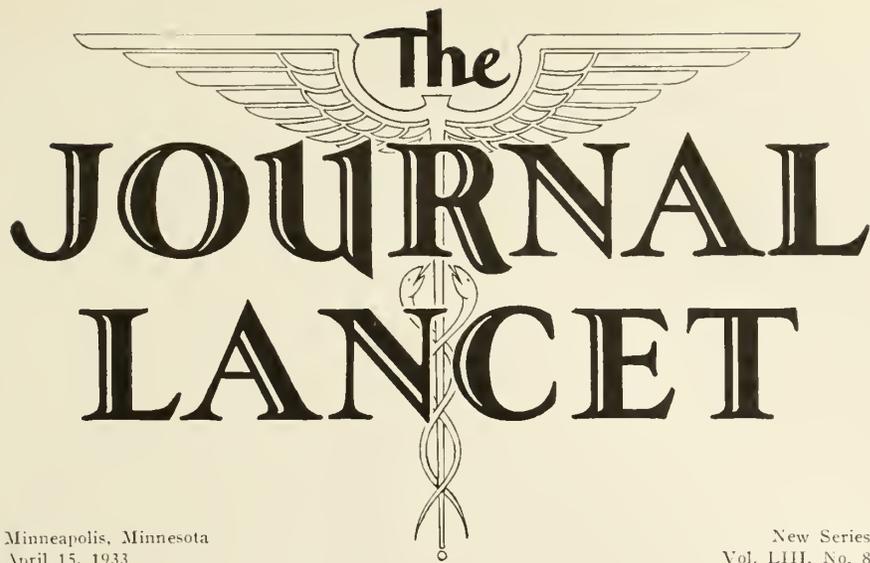
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Recognition and Treatment of Thoracic Suppurations of Pulmonary Origin*

Owen H. Wangensteen, M.D.†
Minneapolis

THE unhappy experiences with empyema during the World War served to awaken a keen interest in all thoracic suppurations of pulmonary origin. Shortly after the conclusion of the war, a group of men intensely interested in thoracic diseases met in New York City at the suggestion and under the leadership of the late Willy Meyer. Out of the earnest enthusiasm of this small group has grown the American Association for Thoracic Surgery, the studies and deliberations of which body have added significant contributions to this branch of knowledge and continued the stimulating interest by the World War in thoracic suppurative diseases.

The objective physical findings elicited by percussion and auscultation, contributions of Auenbrugger and Laennec, established relatively early reliable criteria by which diseases of the thorax could be recognized, whereas identification of the disease entities that afflict the contents of the large serous cavity beneath the diaphragm came only with knowledge of asepsis and bacteriology that permitted its safe exploration by the surgeon. Roentgen's epochal discovery also found ready and direct application in the interpretation of thoracic shadows attending pulmonary disease and constitutes today a diagnostic measure that is rarely superseded in accuracy. In 1922 Sicard and Forestier contributed bronchography or filling of the bronchial tree with a medium opaque

to the X-ray which permits of complete visualization of the conduits of the respiratory organs.

In perhaps no internal viscus heir to a multiplicity of lesions, including the kidney, in which the accessible means of examination may tell a tale so accurately that often only the pathologist with the organ at his disposal can improve upon it, are more reliable criteria of diagnosis available to the physician than when he deals with diseases of the lung. A careful appraisal of the details of the history usually affords an important clue in unravelling the succession of events and in determining the probable differential diagnosis. A thorough and well-executed physical examination elaborates the history and serves to delimit the diagnostic possibilities. A minute inspection of the gross character of the sputum and microscopic examination of its bacterial content may identify or exclude certain entities entertained in the differential. An X-ray examination (including bronchography) affords accurate determination of the location, size, and character of the lesion. The determination of the vital capacity serves to establish the degree of functional impairment present. The pleural cavity may be explored with the aspirating needle and the bronchial tree further examined with the bronchoscope.

Rarely in the management of a single disease entity or in the treatment of various diseases that may affect one organ does any individual become

*Read at the meeting of the North Dakota State Medical Association at Grand Forks, on June 1, 1932.

†From the Department of Surgery, University of Minnesota.

master of all the diagnostic and therapeutic agents that pertain thereto. In the conduct of thoracic suppuration of pulmonary origin, the co-operation and co-ordination of knowledge of internist, Roentgenologist, clinical pathologist, bronchoscopist, and surgeon contribute to the best interests of the patient.

The three commonly observed varieties of pleuropulmonary suppuration that frequently necessitate the attention of the surgeon are empyema, pulmonary abscess, and bronchiectasis.

EMPYEMA

Etiology—Suppuration in the pleural cavity is most frequently observed as a complication of pneumonia, the extension occurring through the subpleural lymphatics into the pleural space or by rupture of a tertiary bronchiole. A pulmonary abscess may similarly rupture into the pleural cavity. These are the two more frequent sources of empyema. More rarely it is observed as a manifestation or sequel of a bacteremia. Penetrating wounds of the chest wall may result in empyema as well as non-penetrating wounds in which hemothorax and pneumothorax attend the injury, and occasionally empyema results by rupture or extension of a subphrenic infection through the diaphragm.

Symptoms and Diagnosis—Strong presumptive evidence for the existence of empyema is present when a patient convalescing from pneumonia begins to run fever again. The onset may be so gradual that only the occurrence of fever denotes the presence of suppuration, or the complication of empyema may be heralded by rapid respirations, quickening of the pulse, cyanosis, dyspnea, and hyperpyrexia. In the meta or post pneumonic empyemas the chief symptoms are fever, a feeling of tightness in the chest, dyspnea and malaise.

The physical findings in the chest are essentially those of a pleural effusion. On inspection, the affected side may bulge or appear flat and exhibit slight or no respiratory excursion. The heart in massive seropurulent pleural exudates is usually displaced toward the opposite side. Tactile fremitus is usually absent. The involved side is dull on percussion and breath sounds are usually not or only faintly heard. The heart sounds may be distinctly audible, however, transmitted through the fluid medium.

Roentgen examination usually shows one side of the chest to be opaque to the X-rays with displacement of the heart to the opposite side. Determination of the vital capacity may give a reading that scarcely exceeds the tidal air requirement.

No treatment should be instituted in empyema until the pleural space has been aspirated with a needle and the presence of pus in the pleural space verified. A serous type of exudate is usually synonymous with a streptococcic infection whereas pneumococcic exudate is usually fibrinous even in its early stages. Some of the aspirated exudate should be immediately submitted to microscopic examination after staining a smear with Grams' stain to make certain of the presence of pyogenic organisms. The necessity for this precaution lies in this: every now and then, a tuberculous empyema presents itself as an acute infection without palpable definite evidence of a previous parenchymatous lesion in the lung causing symptoms. If ordinarily demonstrable by the Roentgen rays, in the presence of the pleural exudate the tuberculous lesion in the lung would be obscured and probably not recognized. In the absence of pyogenic or secondary infection, all other forms of drainage other than with the aspirating needle are to be avoided in tuberculous empyema.

Treatment—It has long been a fundamental principle in surgery that wherever pus is present it should be evacuated. This dictum in practise, however, has become very much modified. The question of which tissue is involved in most instances determines the mode of action. Whereas acute inflammations of bone, tendon sheaths or the appendix are regularly subjected to early operation, those of the lymph and blood vessels, the brain and lung itself respond better to conservative treatment during the acute phase. In hematogenous infections of the largest serous cavity of the body, viz., the peritoneum, (streptococcic and pneumococcic peritonitis) better results are achieved by conservative management than by open drainage. In early infections of the peritoneum arising from a focus within the cavity, the primary lesion must be adequately dealt with. In late diffuse infections of the peritoneum of appendiceal origin, I am convinced that conservative treatment holds out more hope to the patient. In pyogenic infections of the serous cavities of the joints and pericardium the aspirating needle and incision each have a place.

The problem peculiar to acute pyogenic infections of the pleura is the subatmospheric pressure of this serous cavity. In watery types of exudates in which there is no fixation of the lung or pleura through the medium of adhesions to the chest wall, wide open drainage of the chest though it evacuates the pus, collapses the lung and contributes to the patient's respiratory embarrassment, in that there being no fixation

of the mediastinum, the admission of atmospheric pressure into the pleural space, displaces the mediastinal structures and collapses the other lung as well. The experience of the war with the synpneumonic streptococcic empyemas (concurrent with the pneumonia) showed that it was better to disregard the exudate in the pleural cavity than to open the chest by rib resection.

The character of the exudate therefore determines the nature and extent of the therapeutic intervention. In serous exudates, aspiration may be made with a needle until the pus becomes so thick that it can no longer be satisfactorily removed in this manner.

Inadequate or delayed drainage is probably the most important factor contributing to the establishment of chronic empyema, and aspiration with a needle at daily or longer intervals does not constitute good drainage, but is a substitute of necessity in dealing with extremely ill patients. In infants in whom operation in the acute toxic state is not well borne, it is a particularly valuable agent and its more frequent use has contributed definitely to a lowering of the mortality. An alternative procedure and the one employed by most surgeons in dealing with serous exudates is to establish "closed drainage" with a catheter through a trochar puncture in a dependent intercostal space. Caution is observed that no air is admitted to the pleural cavity during this minor operative procedure, which may well be done at the patient's bedside. The catheter is sealed to the chest with adhesive tape or a liberal dressing of cotton and collodion to prevent the entry of air after operation.

In the fibrinous exudates of pneumococcic empyemas, the same deterrent to open drainage by rib resection does not obtain. It is, however, the wiser plan in early instances to establish drainage first with the intercostal catheter, and when doubt no longer exists concerning the stabilization of the mediastinum to resort to rib resection. A fairly large number of empyemas, particularly those in which treatment is instituted while the exudate is thin, may satisfactorily be carried through to healing by "closed drainage" alone.

In establishing drainage in the chest, whether it be by the intercostal catheter or by rib resection the drainage must be dependent. The experiences of the war taught also that the employment of irrigation with Dakin's solution aided materially in sterilizing the cavity, digesting the fibrin and re-expanding the lung. In the employment of irrigation, it is important to determine that a bronchial fistula is not present. Irrigation with

Dakin's solution in the presence of a bronchial fistula may provoke a distressing cough due to the entry of the irrigating solution into the bronchus, and asphyxia may attend its aspiration into the trachea. The first irrigations are therefore best made with saline solution. Cough or tasting of the solution indicate the presence of a pleuro-bronchial fistula. Such a fistulous communication usually is small however and closes spontaneously fairly rapidly in the majority of instances.

Under the influence of drainage and irrigation, a large cavity quickly reduces in size, due largely at first to the evacuation of the pleural exudate and the consequent expansion of the lung. The final obliteration of the cavity, however, progresses at a much slower rate, and is obtained also by the further re-expansion of the lung, which is to be encouraged by having the patient perform exercises that increase the intrabronchial pressure, such as blowing water from one bottle into another. This process may be considerably hastened by the resection of short segments of one or two ribs over the remaining cavity, permitting the muscles and soft parts to fall in somewhat, thus contributing materially to the reduction in size of the cavity.

The empyema is to be considered cured not when the patient becomes afebrile and the symptoms disappear, but only when the cavity has become completely obliterated by re-expansion of the lung. The premature withdrawal of the drainage tube will permit an unobliterated space to remain in whose walls infection may persist with subsequent recurrence of inflammation.

Encapsulated Empyema—Occasionally a patient presents himself directly or remotely after convalescence from pneumonia with the history of fever of unexplained origin. The physical findings in the chest may be indeterminate or minimal. X-ray examination alone often establishes the diagnosis and when correlated with the history the condition is to be recognized in the majority of instances. When the encapsulations are small, pus may not be easily reached with the aspirating needle. Drs. Sägel and Rigler have described a number of mediastinal encapsulations observed at the University Hospital and have pointed out that these exhibit a tendency to clear up spontaneously by resolution and absorption of the exudate or may be dealt with satisfactorily in the majority of instances by aspiration alone. Though the small encapsulations over the periphery of the lung of an acute nature may similarly resolve spontaneously, I have the impression that this is less likely to

occur than in the mediastinal encapsulations near the hilum of the lung.

Chronic encapsulations have to be dealt with surgically. Postero-anterior and lateral films of the chest are the best guide in placing the incision. In event that the encapsulation is not immediately encountered, it may usually be found with comparative ease, by continuing the dissection in the direction in which the parietal pleura exhibits an increase in thickness. Interlobar encapsulations occasionally have to be managed in accordance with the principles with which one deals with a lung abscess, securing adherence of visceral and parietal pleura before establishing drainage.

A number of instances of encapsulations have come to my attention in which the occurrence of empyema has been entirely overlooked, though its presence may have been suspected.²² These occult empyemas however, can usually be identified by a careful physical examination and by inspection of lateral and postero-anterior films of the chest.

Chronic Empyema—A number of factors may contribute to chronicity or failure of cure in acute empyema, of which the following are the most important. (1) Delayed, improper or inadequate drainage; (2) withdrawal of the drainage tube before the lung has been completely expanded; (3) persistent broncho-pleural fistula obviating the employment of measures which aid in expanding the lung; (4) persistent infection in the residual walls of the empyema cavity, often associated with considerable thickening of the parietal pleura; (5) osteomyelitis of ribs or foreign body (drainage tube) in the cavity.

In a fairly recent empyema, much can often be accomplished by opening up the sinus of the old drainage tract, introducing a catheter through which frequent instillations of Dakin's solution are made and instituting energetic measures to expand the lung. I have seen a lung almost totally collapsed in a patient with empyema in which treatment had been discontinued three months before when the patient became afebrile, completely re-expanded by these conservative measures. When a patient with a long standing process presents himself with evidence of acute infection, drainage should be instituted before procedures of a major character directed toward permanent eradication of the disease are carried out.

Complete obliteration of the persistent cavity is demanded in dealing adequately with chronic empyema. This may be achieved by the resection of ribs and sacrifice of intercostal muscle bundles and unroofing of the cavity and by excision of the

greatly thickened parietal pleura, which measures bring the chest wall to the lung; or an attempt may be made to expand the lung by rib resection, excision of the thickened parietal pleura and removal of the slightly thickened membrane that uniformly overlies the lung in chronic empyema. In the presence of a parenchymatous lesion in the lung, removal of this lamina is impossible, but I have been frequently astonished to see how, when the lung, freed from the restraining influence of this membrane, will expand into the wound even when it has been long collapsed. One of these patients had been operated upon six times previously over a nine-year period. The moment the lung was released it expanded immediately; it was not atelectatic.

Tuberculous Empyema—Unlike other empyemas, tuberculous exudates have to be managed without the re-expansion of the lung which is the chief factor in obliterating the cavity in pyogenic suppurations in the pleura. The empyema must be dealt with while the tuberculous lung is maintained collapsed. Aspiration of the exudate and replacement with air is the most efficient remedy. No matter how high the fever or how thick the exudate, a drainage tube is not to be introduced until pyogenic contaminants have been shown to be present by smear or culture. As the lesion in the lung improves, the pleura also usually manifests equal improvement. Tuberculosis of serous cavities exhibits an unusual tendency to clear up if the primary focus subsides or can be satisfactorily managed. When secondary infection is present, catheter or open drainage by rib resection should be done, followed later by posterior thoracoplasty and final unroofing of the cavity if necessary.

LUNG ABSCESS

Etiology—The two most frequent causes of lung abscess appear to be a previous surgical operation, usually upon the oral cavity or throat and pneumonia. Other less frequent antecedents of lung abscess are the aspiration of a foreign body, benign and more frequently malignant tumors of the lung and bronchi, extension of infection from a subphrenic abscess through the diaphragm into the lung, blood stream infection from a septic focus elsewhere, and penetrating wounds of the lung. In addition, a number of miscellaneous infections such as actinomycosis, blastomycosis, amebic dysentery and echinococcus infestation are accompanied by the development of a pulmonary abscess.

Whereas the work of a number of experimental workers tended to show that the postoperative lung abscess was of embolic origin from an in-

fect field, most clinicians have continued to hold tenaciously to the belief that these were largely due to aspiration. In recent years, laboratory evidence has been adduced to show that experimental lung abscess can be established by the aspiration method. The occurrence of lung abscess following tonsillectomy under local anesthesia is satisfactorily explained in that Iglauer demonstrated the presence of blood in the trachea by bronchoscopy in 40 per cent of patients having had tonsillectomy under local anesthesia. The necessity for minute hemostasis in oral operations is apparent when it is realized that with the swallowing reflex abolished by local anesthesia of the pharynx, that any oozing of blood is likely to be aspirated into the tracheo-bronchial tree. Similarly tonsillectomized patients, whether done under local or general anesthesia, and all unconscious patients for that matter, should be returned and maintained in bed with the head low until the swallowing and cough reflexes are established again.

The organisms encountered in lung abscess are the common pyogenic invaders. Staphylococcus is most often found being present in about 80 per cent of instances. The streptococcus and pneumococcus are next in frequency and a large number of other organisms are not infrequently present. Pulmonary gangrene is distinguished from pulmonary abscess by the presence of the fusiform bacilli and spirochaetes, secondary invaders from the mouth.

Pathology—Lung abscess occurs in the right lung in approximately 75 per cent of instances, and in about 50 per cent of instances the lower lobe is involved, attesting the significance of the aspiration factor in the genesis of lung abscess, the right lower lobe bronchus being the most direct continuation of the trachea.

The most frequent variety of lung abscess is the central type surrounding a large bronchus near the root of the lung. The abscesses located at the periphery of the lung are more likely to be of metastatic origin through the extension of a septic process though an absolute differentiation as to the source of origin can not be made on this basis. Metastatic lung abscesses are not uncommonly bilateral and multiple, though a single abscess may follow the development of a septic infarct in the lung.

The area of consolidation in an early lung abscess is probably not unlike a pneumonic process. The mechanism of resolution, however, is entirely different. Whereas in a lobar type of pneumonia the disappearance of the cellular exudate occurs rapidly; within three to 10 days as

judged by Roentgen studies, spontaneous healing in lung abscesses is a slow process. Occasionally healing may occur by resolution, in which event the existence of an abscess as differentiated from a pneumonic consolidation would be difficult to establish. The reparative process in a lung abscess is almost invariably characterized by a disintegration of lung tissue, which may be molecular or massive with the consequent formation of multiple minute or one or more large cavities.

The conservative plan of treating acute lung abscesses by watchful waiting has demonstrated that the process of spontaneous healing is a common occurrence. Accompanying both the molecular and massive disintegration of pulmonary tissue a chronic process may become established in the lung necessitating surgical interference. Attendant upon the persistent continuance of an inflammatory lesion in the lung, considerable scar tissue forms which in the presence of multiple small suppurating areas gives rise to a carnified and indurated lung. The bronchi in consequence thicken and also become distorted and bronchiectatic dilations almost regularly ensue. The end process of a chronic lung abscess may therefore be a veritable marsh of suppuration in which the reparative process of fibrous connective tissue formation has only succeeded in isolating honey-combed abscesses with stiffened walls which preclude drainage. Retraction of the mediastinal structures may also accompany the chronic suppurative process within the lung.

Symptoms and Diagnosis—The early symptoms of lung abscess are those of a pneumonic consolidation in which pyrexia, a hurried pulse, dyspnea and cyanosis, weakness and sweating are the usually observed phenomena; pain ordinarily attends only the peripheral abscess in which the pleura may be also involved. Cough is often paroxysmal; in the foreign body abscess a harassing cough usually antedates the infectious features. A mucoid expectoration frequently precedes communication with a bronchus. Rupture of the liquifying content of the abscess into a bronchus usually establishes the diagnosis.

Expectoration of a thick tenacious muco-purulent sputum in large amounts is characteristic, 500 to 1,000 cc. a day is not unusual. This sputum comes not only from the abscess cavity in the lung, but is contributed to ordinarily by a catarrhal inflammation of the bronchi. During the early course of a lung abscess when considerable pulmonary tissue is being autolyzed the sputum has a foul putrid odor. When the process becomes well localized and proteolytic tissue destruction is at a minimum, however, there is ordinarily no

stench to the sputum; on the contrary, it has a rather sweet smell. Foul lung abscess sputum is usually tinged with red due to the admixture of blood and disintegrated tissue, though color variations from green-yellow to white are frequent. After standing in a conical glass the sputum usually separates out into three layers as does also the sputum regularly in cases of bronchiectasis and not uncommonly in empyema with a broncho-pleural fistula as well as in putrid bronchitis. At the bottom there are pus, bacteria and disintegrated tissue, the middle layer is a thin turbid fluid consisting largely of a serous mucopurulent material and saliva; the top layer is frothy due to its air content. The stratification of the sputum into layers is, however, of no particular diagnostic significance.

The gross inspection and examination of the sputum, is often very informative as to the source of its origin. In complicated cases of long standing when a proliferative reaction precludes an accurate interpretation from a Roentgen standpoint and the physical findings are equally confusing, I have found the gross character of the sputum to be very helpful in differentiating between intrapulmonary suppuration and an encapsulated empyema with a bronchial fistula. The liquid content of expectorated empyema sputum is ordinarily greater and it can usually be poured from one container into another with relative ease. Lung abscess sputum on the contrary is very tenacious and though some of it may be poured, long sticky, stringy strands of icicle-like formation follow attempts to pour the sputum into another container at a lower level.

In my experience, microscopic demonstration of elastic tissue fibers in sputum in suppuration of intra-pulmonary origin is of little or no differential value in that such elastic fibers are only regularly found during the acute phase when considerable pulmonary tissue is being disintegrated.

The physical findings of early lung abscess are those of consolidation; later those of single, large or multiple cavity formation are superimposed. In chronic ulcerative suppuration accompanied by a proliferative reaction the findings may be those of a mass in the lung or of thickened pleura.

The Roentgen film early reveals an area of irregular density which may be confused with a pneumonia or a resolving consolidation. When the cavities become apparent, an absolute diagnosis may be made. In chronic abscesses confusion with atypical tuberculous cavities may occur, but the clinical findings and microscopic examination of the sputum serve to differentiate the conditions.

Resort should not be had to the employment of the aspirating needle in the diagnosis of uncomplicated lung abscess because of the attendant danger of infecting the pleural cavity.

Differential Diagnosis—A lung abscess in which communication with a bronchus has been established is usually easy of identification. Before rupture into a bronchus, confusion with pneumonia may occur, but follow-up Roentgen studies demonstrates failure of resolution as occurs in pneumonia, with the added feature of disintegration of the interstitial tissue and cavity formation.

Late complicated suppurative processes in which empyema or bronchiectasis may also be present occasionally afford some difficulty in determining the source of the continued suppuration. Careful inspection of the gross characters of the sputum, the use of the aspirating needle, through which methylene blue is to be injected if pus is recovered to detect the presence of communication with a bronchus, and the employment of lipiodol-filling of the bronchial tree on the affected side will serve to establish the origin of the suppuration.

Interlobar empyemas may be difficult of differentiation but failure to establish communication with a bronchus in chronic interlobar collections of exudate together with its sharper outline on the X-ray film distinguishes it from a chronic pulmonary abscess.

Non-opaque foreign bodies and tumors of the bronchi or lung itself which not uncommonly give rise to pulmonary abscess are not infrequently so obscured by the manifest suppurative lesion as to escape detection. The bronchoscope and the history are the best differential criteria.

Tuberculosis, bronchitis and bronchiectasis can be adequately differentiated from pulmonary abscess by the combined use of Roentgen examination, lipiodol filling, and microscopic examination of the sputum.

Blastomycosis, actinomycosis, amebic infection and echinococcus cyst, all of which may produce pulmonary abscesses, are usually only recognized by special examinations when their presence is suspected. The presence of cutaneous lesions in blastomycosis not uncommonly gives an important lead and the finding of the budding blastomyces in the sputum establishes the diagnosis. One such case came under my observation in which the pulmonary abscess cleared up spontaneously but the patient died some months later of generalized blastomycosis.

Actinomycosis of the lung is rarely diagnosed early. A lesion involving lung, pleura and chest wall accompanied by a periosteitis of the ribs is

very likely to be actinomycosis. The expectoration of sulphur-like granules in which the actinomyces may be demonstrated establishes the diagnosis. It is not to be forgotten, however, that an actinomyces-like streptothrix was found by Thompson in 65 per cent of 2,000 sputum examinations in pulmonary suppurations of varying kinds. In the only case of primary actinomycosis of the lung that has come under my care, the diagnosis was made by aspiration and the recovery of sulphur granules in which the organism was demonstrated. Actinomycosis tends to spread locally and burrow to the surface and does not generalize frequently in the manner that does blastomycosis. Graded but radical surgery is therefore justifiable in pulmonary actinomycosis and cases have been cured by such means.²³

Amebic infections arrive in the lung (usually the right) by progression of a suprahepatic or subdiaphragmatic infection, going out from an amebic abscess of the liver extending through the diaphragm. The presence of an antecedent diarrhea, the finding of the endameba histolytica in the stool and an ulcerative lesion on Roentgen examination in the caecum (usually) together with the antecedent history of liver and subphrenic infection suggest the nature of the pulmonary infection. Emetin and needle aspiration* usually suffice to cure an amebic liver abscess, open operation only being done for secondary infection. Emetin and conservative methods are usually adequate for the treatment of pulmonary abscess though operation may occasionally be necessary in dealing with the subphrenic infection.

Pulmonary echinococcus complicated by abscess is seen commonly only where sheep grazing is an important industry. The unusually distinct outline of the cyst together with a more translucent interior as visualized on a Roentgen film suggests the diagnosis. The employment of the Weinberg complement fixation and the Casoni intradermal tests in suspected cases establishes the diagnosis. Echinococcus cysts of the lung as well as those complicated by pyogenic suppuration are best treated by a two-stage surgical drainage as employed in ordinary chronic lung abscess.

Complications of Lung Abscess—Owing to the excavation in the lung, erosion of blood vessels may occur with consequent serious hemorrhage.

Extension into the pleural cavity with resultant empyema is an occasional serious complication, particularly in the peripheral type of lung abscess. Extension of infection into the mediastinum and pericardium as well as into the other lung, occasionally occur.

*Needle aspiration of an amebic liver abscess is a safe measure in that secondary pyogenic infection is rarely present.

Cerebral abscess is not an uncommon complication in all types of pulmonary suppuration. It is estimated that this dangerous sequel occurs in 10 to 13 per cent of all cases of pulmonary suppuration. The motor area in the left cerebral hemisphere is most frequently involved (75 per cent of instances) due to the anatomical fact that the left carotid artery comes directly off the aortic arch. This complication is usually fatal. Barling records an instance that recovered with operation and I have seen such a lesion clear up spontaneously.

In prolonged pulmonary suppuration of any origin, amyloid deposits in spleen, liver and kidneys may occur and lead to a fatal issue. The removal of Congo red from the blood stream following intravenous injection will frequently identify the presence of amyloid disease before it may otherwise be definitely recognized.

Clubbing of the fingers and toes is a common complication in all types of chronic pulmonary suppuration. Its presence is also significant of febrile disturbances and usually indicates that the patient has had symptoms from the continued suppuration. The thickening ordinarily only concerns the soft tissue, but the bones not infrequently show enlargement. Occasionally large bones such as the femur exhibit marked periosteal thickening.

Treatment—Conservative measures such as bed rest and the employment of the inverted posture and bronchoscopy to facilitate drainage, result in spontaneous healing in about 75 per cent of primary acute lung abscesses. Whereas previously many of these were operated upon in the acute phase before localization had occurred, with a consequent high mortality because of the extension of the infection, it is now well established that if the acute primary lung abscess is left alone it will heal in the majority of instances. Only in exceptional instances is operation indicated in the acute phase. Surgery is to be reserved almost entirely for the management of chronic lung abscess.

Pneumothorax is to be recommended only for central types of lung abscess in which communication with a bronchus has already been established. Its employment in peripheral lung abscess is attended with considerable risk of rupture into the pleural space with the development of empyema. Those who do employ pneumothorax in the treatment of peripheral lung abscess observe the precaution of employing only a minimal tension pneumothorax.

If after a few weeks' trial with conservative measures, the lung abscess still persists it is best

to have recourse to surgical drainage for long continued pulmonary suppuration gives rise to carnification with crevasses of isolated abscesses through the pulmonary tissue as well as bronchiectasis. However, one patient who developed pulmonary abscess following tonsillectomy came under my observation with continued symptoms and suppuration one year following its onset, and was cured by three bronchoscopic aspirations.²⁴

In central abscesses in which no pleural thickening has occurred a two-stage operation is to be done. At the first sitting, short segments of three to four inches in length of two or three ribs are removed over the abscess and the intervening muscle bundles are removed and the intercostal vessels ligated. The placement of a gauze pack upon the parietal pleura results in intimate union between parietal and visceral pleurae. A week later, drainage of the abscess may be done through this area without danger of infecting the free pleural space. If at the first operation the visceral and parietal pleurae are found adherent, an immediate opening of the abscess may be done.

Local anesthesia is always to be preferred in dealing surgically with pulmonary abscess. In patients who are best not present at their own operation and for which an inhalation anesthetic is almost mandatory, it is essential that the abscess cavity be drained out as thoroughly as possible by coughing before commencing the anesthetic.

The postero-anterior and lateral films of the chest constitute the best guide as to the exact location of the abscess and the choice of operative approach. On the whole, lower lobe abscesses are best approached by a posterior incision, while upper lobe abscesses are best drained through the axilla or below the clavicle in front. When the drainage is made laterally by excision of ribs on the cylinder of the barrel of the chest, a longer drainage tract results than when the incision is made posteriorly or in front.

After aspirating with a needle to locate the abscess, I prefer to cut down upon the abscess in the pulmonary substance with the cautery, burrowing a narrow tunnel from the surface of the lung into the abscess cavity. This process is decidedly more time consuming than plunging a hemostat along the needle tract, but it insures adequate hemostasis and is much safer. I employ the endotherm for this purpose, first coagulating the lung tissue and then remove the charred tissue with the cutting current. When the abscess cavity is opened, it is loosely packed with gauze, which in turn is replaced by a soft rubber tube in a few days.

A carnified lung with multiple abscesses not infrequently needs a fairly liberal destruction of pulmonary tissue in order to provide adequate drainage, following which occasionally many bronchial stomata result. When complicated by bronchiectasis as well, a thoracoplasty must also occasionally be done to obtain as complete compression of the diseased lung as possible. If supuration still continued after a good chest wall collapse has been obtained, resort should be had to cautery lobectomy.

Phrenectomy is of some value in aiding the collapse of a large abscess cavity and in decreasing the risk of hemorrhage from such cavities.

PULMONARY GANGRENE

Pulmonary gangrene should not be considered apart from pulmonary abscess in that the nature of the pathological lesion is essentially the same. I have seen a lung abscess getting along well on conservative management eventuate in pulmonary gangrene and death. The presence of secondary invaders from the mouth, particularly fusiform bacilli and spirochaetes are believed to be chiefly responsible for the gangrenous inflammation. This type of pulmonary infection exhibits rarely any tendency to localization. Extension of the gangrene through the lung as well as into the pleural cavity and mediastinum is more frequent than circumscribed pulmonary gangrene. Sauerbruch states that pulmonary gangrene is observed more frequently in alcoholics and diabetics. The foul, putrid stench to the sputum which may be red, grey or green in color, establishes the diagnosis. A hazy diffuse lesion is usually seen in the X-ray film that looks like pneumonia.

Treatment is unsatisfactory. Localized processes may heal. Sauerbruch¹³ believes that the operative treatment holds out the best hope. It is somewhat difficult to believe, however, that surgical drainage can be of much value in a spreading infection. Kline and Berger of Cleveland recommend intravenous injections of arsphenamine.

BRONCHIECTASIS

Etiology—Bronchiectasis occurs far more commonly than is generally believed. Postmortem studies show that one to two per cent of adults probably have it. The more frequent employment of lipiodol filling in those having considerable sputum has resulted in its more frequent recognition. It occurs in both sexes and at all ages. Bronchiectasis can not be said to be a specific disease entity. It follows or accompanies a number of diseased conditions in the thorax, but the mechanism of its causation is best understood in obstructive lesions.

Not infrequently bronchiectasis begins early in life. Sauerbruch¹⁴ believes that a number of these are congenital. In the Department of Pathology at the University of Minnesota where a fairly active postmortem service on new-born infant material has been in operation over a period of several years, congenital bronchiectasis has been very rarely observed. The single large cysts as well as the cystic lung may be considered congenital bronchiectatic dilatations allied to cystic disease more commonly observed in the kidney, liver and pancreas.

Obstruction of a bronchus by foreign body or tumor, whether intrinsic or extrinsic is a well understood cause of bronchiectasis; and it is really surprising how quickly the bronchial dilatation follows the obstruction. Because of the obstruction of the bronchus, the air in the corresponding lobe of the lung is absorbed and atelectasis occurs.

Dr. Rudolph Koucky, of our surgical staff, has determined the intrapleural pressure in a few instances of massive collapse of the lung occurring after abdominal operations at the University Hospital. Startling increases in negative pressures were occasionally encountered. In one instance the intrapleural pressure was 40 millimeters of mercury less than atmospheric pressure.

It is readily apparent therefore that plugs in the bronchi as well as inflammatory lesions in the lung of an obstructive character may give rise to atelectasis with alterations in the normal intrapleural pressure variations. With the continuance of a block in the bronchus an inflammatory reaction occurs within the lung substance and in consequence of a lessening of the pressure immediately external to the lung, the bronchi dilate.

Unresolved pneumonia is probably a frequent cause of bronchiectasis. Lobar pneumonia if accompanied by bronchial plugs may be an antecedent of bronchial dilatation. The severe influenza pneumonias of the War in which the interstitial tissues of the lung were also invaded, it is believed, is in part responsible for the frequency with which bronchiectasis is observed in those that had the infection. Chemical injury of the bronchi by war gases have been followed by bronchiectasis. Prolonged suppuration within the thorax whether due to lung abscess, tuberculosis or empyema not uncommonly gives rise to bronchiectasis. Measles, whooping cough and broncho-pneumonia are not infrequent antecedents in children.

Paranasal sinus infection is not an uncommon accompaniment of bronchiectasis, and it is believed by some that paranasal sinusitis may in a

manner be responsible for the development of bronchiectasis, as well as contribute to its persistence in others. It has been shown that if during sleep a little lipiodol is placed in the nasopharynx it can often be demonstrated later in the lung on Roentgen examination. It is therefore understandable that during sleep "droppings" from the throat may readily get into the terminal bronchi.

Experimentally, bronchiectasis can uniformly be brought about by bronchial obstruction. D. T. Smith claims to have produced bronchiectatic dilatations in rabbits by infecting the bronchi through a bronchoscope with fusiform bacilli and spirochaetes. Control attempts with organisms such as the staphylococcus, streptococcus and Friedländer bacillus which are commonly found in the sputum of patients with bronchiectasis, Smith states, failed to produce damage to the bronchi.

Pathology—Bronchiectasis affects usually the terminal bronchi of the lower lobes of the lung. In more than one-half the cases the lower left lobe alone is involved. Occasionally the right lower lobe alone participates in the bronchiectatic dilatations and in one-third of the cases both lower lobes are involved. Occasionally an entire lung exhibits dilatations of its bronchi.

The walls of the bronchi are usually thickened and not infrequently granulation tissue which exudes a mucoid pus studs its walls. The dilatations may be saccular or cylindrical. The pulmonary tissue is indurated and fibrotic, and the final picture is cirrhosis of the lung. Small abscesses are commonly present in the pulmonary substance. The pleural space may be free or there may be stringy or dense adhesions between the involved lobe and the thoracic cage and diaphragm.

Bronchiectasis is a chronic progressive disease and spontaneous healing is rarely seen. In instances in which the cause is removed (foreign body) there may be no progression.

Symptoms and Diagnosis—Cough and expectoration of large quantities of sputum are the essential complaints. The gagging in the expulsion of the sputum may give rise to regurgitation of food from the stomach after eating. Sputum may be expectorated throughout the day or it may be largely brought up in the morning. Some patients with dilatations of their bronchi only have sputum following a cold and may have long intervals without any complaint. Following a cold, such a patient not infrequently has a bout of high fever, occasionally initiated by a chill. Profuse expectoration which may last a week, a month, or longer, follows accompanied by soreness of the chest. Severe chest pain is rarely complained of.

The nutrition in bronchiectasis is frequently impaired.

The sputum is usually a fairly thick viscid whitish material, occasionally tinged with yellow or green and with red after hemorrhage, that separates into three layers on standing. Contrary to general belief, the sputum is not always foul. Patients with bronchiectasis frequently have a fetor on their breath but the sputum more commonly has a musty odor. Occasionally, and especially following hemorrhages and renewed infections the sputum may be putrid. Elastic tissue fibers are not easily demonstrable on microscopic examination in the sputum of chronic cases.

Severe and repeated hemorrhages are not uncommon and frequently give rise to confusion with the hemoptysis of tuberculosis. Clubbing of the fingers and toes is a frequent occurrence in chronic cases. Amyloid disease occasionally terminates the picture in instances in which the supuration is active and long continued. The more frequent terminal event, however, is a pneumonia. Cerebral abscess is not uncommon.

The physical findings may be surprisingly slight. Bubbling rales at the base are the most constant finding. Where the bronchiectatic dilatations have replaced a considerable amount of the pulmonary tissue, the signs of cavity formation may be present. Dullness may also be encountered when considerable induration is present. Retraction of the mediastinal structures may also be observed.

The diagnosis can be made with certainty by Roentgen examination after lipiodol filling. Only rarely is the bronchial secretion so thick as to preclude the opaque oil getting into the ramifications of the terminal bronchi. Roentgen films of the chest without the use of lipiodol are not reliable in the recognition of bronchiectasis. The patient is instructed to forcefully cough out the content of his bronchi, the throat, (nasopharynx and tonsillar folds) is then swabbed with 10 per cent cocaine and the patient takes an ounce of lipiodol into his mouth. Under the fluoroscope he is instructed to breathe in through the mouth and the lipiodol, in consequence of obliteration of the swallowing reflex, is aspirated into the bronchi. Postero-anterior and lateral films give an accurate impression as to the type and location of the bronchial dilatations. Inclination of the patient to one side will cause the greater portion of the opaque oil to go into the corresponding bronchus. An alternative method of doing the lipiodol filling is to drop the oil over the base of the tongue with a syringe through a

catheter or curved cannula, preferably after anesthetizing the larynx.

The lipiodol remains in the lung for some time but does no harm. The greater portion of the lipiodol in the bronchi is usually expectorated within a few days. If the patient coughs shortly after the administration, lipiodol is forced into the alveoli from where it is only very slowly removed by phagocytic action.

Bronchoscopy is of value in the diagnosis of bronchiectasis in excluding the presence of bronchial stenosis as well as in the determination of the source of sputum in bilateral cases. Lipiodol fillings are occasionally made through the bronchoscope and successful demonstrations of suspected bronchiectatic dilatation are sometimes made by this means when others are unsatisfactory.

Differential Diagnosis—Bronchitis, tuberculosis, pulmonary abscess, and empyema with pleural fistula are the conditions that have to be differentiated. The Roentgen findings before and after lipiodol filling, careful examination of the gross and microscopic characters of the sputum and the history will suffice to establish the diagnosis and the recognition of associated pulmonary pathology.

Treatment—The results of treatment of bronchiectasis on the whole are the most unfavorable of all types of pulmonary suppuration. A number of palliative procedures are available to which recourse may be had, but the disease usually progresses despite their employment. Radical measures in suitable cases are more promising but command at present a respectable mortality. Many patients with bronchiectasis adjust themselves to their handicap and get on fairly satisfactorily though it is not to be denied that bronchiectasis almost invariably shortens life. Radical procedures may be recommended without hesitancy, however, to those who are incapacitated by their complaint and in whom palliative measures have been of no avail. In bilateral cases in which palliative measures have been unsuccessful, little is to be hoped of more radical procedures.

Of the mitigating remedies postural drainage and bronchoscopy are the more effectual. The assumption of the inverted posture a few times a day by the patient who is only disturbed by sputum and who has no febrile or constitutional reaction may solve his problem. It contributes materially also to the reduction of fetor. Expectoants may be of value in a few cases. Paranasal sinus infection, if present, is also to be treated.

The aspiration at intervals of retained secretions in the dilated bronchi through a bronchoscope is undoubtedly a valuable measure in the treatment of bronchiectasis. Many patients with foreign bodies, plugs or granulation tissue or strictures in their bronchi may be cured by removal or dilatation. The addition of bronchial lavage is of questioned worth and it may do harm owing to the flooding of the lung with a fluid medium.

I have seen no lasting improvement from repeated lipiodol filling of the bronchi in established bronchiectasis, though not infrequently a patient declares himself to be temporarily better following its use. It is of most value in bronchitis and in cases of bronchiectasis with slight terminal dilatation of the bronchi. It should be given a period of trial in most instances before recourse is had to more major procedures.

Compressive measures such as phrenectomy and pneumothorax have been of distinct aid in many cases. One might expect that dilated bronchi of the lower lobe would respond very well to paralysis and elevation of the diaphragm. The method has been used in a fairly large number of cases at the University Hospital during the past few years and with immediate reduction of the sputum in most instances. After awhile in the majority of cases, however, there is just as much sputum as previously. In a few instances, nevertheless, abiding betterment has been so striking as to warrant the continuance of this small operative procedure. I have seen no harm come from phrenectomy for bronchiectasis.

In instances in which no amelioration has been obtained with postural drainage, bronchoscopy, repeated lipiodol filling and phrenectomy, we have had recourse to pneumothorax. In the majority of instances a free pleural space has been encountered. In the greater number of instances this measure likewise has been futile and despite satisfactory compression of the lung against the mediastinal structures at the vertebral column, the sputum has continued practically uninfluenced and we have discontinued the pneumothorax. Here as in phrenectomy, however, the results in a few instances have been so remarkable as to indicate its institution in all cases not relieved by lesser measures. We have four cases under treatment with pneumothorax for bronchiectasis at the University Hospital who have been receiving their treatments over a period of years with relief so distinct that they have carried on their usual activities. Each of these patients

has also had phrenectomy as an initial or supplementary procedure.

There are two major procedures to which resort may be had if these lesser measures fail, viz., thoracoplasty and lobectomy. In instances in which there is a free pleural space and an effectual compression with pneumothorax has been obtained without reduction in the sputum, it is obvious that a thoracoplasty will be of no value. Hedblom^{7 8} a few years ago suggested a graded thoracoplasty for cases of severe bronchiectasis in which he removed in stages all of the bony thorax on the affected side (complete deribbing). The results in some instances have been striking in his hands as well as in those of others.

When compressive and other measures fail the only remaining therapeutic alternative is drainage, which is best accomplished by extirpating the diseased tissue. In a few instances bronchostomy or external drainage of a few of the dilated pus sacs has been of distinct aid in materially reducing the amount of suppuration. Like the majority of other palliative procedures, however, it is often ineffectual because inadequate.

The ideal treatment for bronchiectasis is excision of the diseased lobe concerned. Unfortunately, the mortality in the hands of most men has been so high as not to warrant its performance. Because of the risk incurred in surgical excision of the involved lobe in bronchiectasis, Sauerbruch and Evarts Graham have advocated and practised destruction of the involved tissue with cautery. The results on the whole have been very gratifying. The immediate risk is less than with primary lobectomy, though late deaths due to hemorrhage and embolism lessen the disparity in risk of the two procedures. Absolute cures are also fewer than with lobectomy but undoubtedly very ill patients stand a much better chance of definite improvement with this procedure than with primary lobectomy. One of the disturbing residuals is the persistent bronchial fistulae.

Whereas the risk of primary lobectomy by the courageous pioneers in this field was about 50 per cent, Sauerbruch,^{15 16} Brunn and Shenstone have recently, however, reported fairly large individual series of cases in which lobectomy was done with definitely reduced risk. Sauerbruch¹⁶ had four deaths in 38 cases (10.5 per cent) doing usually a multiple stage lobectomy. Brunn of San Francisco reports eight single stage lobectomies with one operative death (12.5 per cent) and Shenstone¹⁹ of Toronto has done

(Continued on Page 214)

The Surgical Treatment of Peptic Ulcer*

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MY subject is the surgical treatment of peptic ulcer. My remarks will apply only to those ulcers which require surgical treatment and later I shall try to point out which must be so treated and which should be watched by such non-surgical measures as seem indicated.

Peptic ulcer is a serious condition. It is all the more serious because it responds symptomatically so readily to simple dietetic and medicinal measures that the practitioner is often misled by the very ease with which the immediate relief is obtained. The symptomatic relief all too frequently simulates cure. Adequate study of such patients will usually reveal the continued presence of the ulcer, the symptoms alone controlled. Persistent blood in the stools, occult or gross, persistent roentgenologic findings, persistent high acidity often with blood in the stomach contents are all compatible with the presence of a symptomless ulcer. That one or more of these findings are absent for various periods may indicate improvement or healing of the lesion. The tendency to recur should lead to the very logical conclusion that the individual ulcer may improve or heal but that the ulcer disease remains.

Peptic ulcer is a local lesion of quite unknown origin. Our intensive studies, both clinical and experimental, over the past half century have failed to reveal whether it is caused by some local factor or is merely the local manifestation of some remote action. That we are able to produce ulcers by the most varied experimental methods loses much of its value from the very obvious fact that none of the methods we employ even remotely resemble processes that can actually play a part in the clinical production of ulcer. Many deductions from experimental work are directly at variance with each other. High acidity and bacterial infection can both be proven to play a part in the production of ulcer, yet in the patient they are almost mutually exclusive terms. None of the gross methods required to produce chronic experimental ulcer can obtain clinically. It seems to me that the repeated heal-

ing of an ulcer, with just as consistently repeated recurrence, often after months or even years of freedom, must be indicative of an underlying disease state of which we are as yet totally ignorant. We are therefore quite unable at the present time to direct our treatment toward the cause of the disease. Our treatment must be empiric or directed toward the pathologic findings and symptomatic relief.

Proper non-surgical, so-called medical care, of an ulcer controls the local disease process so well that patients are often carried over long periods in comparative or complete comfort. The treatment consists essentially in lowering the acidity and lessening the work of the stomach. I have stated that the ulcer may heal under such treatment. The repeated recurrences with which every clinician is familiar indicates that the underlying disease process persists. This is quite clearly indicated by the usual injunction to the patient regarding the need of continued dietary care. All of which indicates that medical care is palliative, that the disease persists that whatever there is of danger to the patient remains.

Conservative non-surgical treatment is entirely logical in many or rather, most ulcers. That many ulcers heal permanently under such care is not open to doubt. It is my impression that all recent ulcers and all ulcers in younger patients without obvious surgical complications should be given the benefit of thorough medical care. Patients handicapped by age or coincident serious ailments also should often be treated conservatively. Persistent ulcers, ulcers that have repeatedly recurred, old ulcers whether previously treated or not must usually end in the surgeon's care. A single severe hemorrhage is not necessarily an indication for surgical care but usually ends as such. Repeated serious hemorrhage is always a surgical indication as is persistent blood in the stools. All of these patients may be treated conservatively. The immediate danger is not great. But such conservative treatment must be of indefinite duration with all the handicap of a permanent dietary life, repeated periods

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of disability, and a degree of danger not always fully appreciated.

Hemorrhage is not usually fatal but deaths are not rare and a massive hemorrhage can never be regarded lightly.

Perforation is a fatal complication unless adequate surgical skill is at hand. These accidents are so scattered that we hardly realize how frequent they are. Cook County Hospital of Chicago receives approximately one hundred such cases yearly. Many other hospitals receive as many.

To the many dangers of duodenal ulcer, lesser curvature ulcer adds the danger not necessarily of being transmuted into carcinoma but rather of being a carcinoma that cannot be recognized as such in its early stages.

Surgical treatment may be quite as palliative in its nature as medical care. The more conservative surgical operations aim to remove or modify some factor presumed to be active in maintaining the ulcer. When analyzed, many of them seem to offer little more than conservative dietetic and medical treatment.

Gastrojejunostomy deflects most of the stomach contents into the jejunum and seems to lower gastric acidity by passing most of the duodenal contents into the stomach. The various secondary effects tending to put the ulcer at rest, etc., are well known. The results obtained over a period of many years are too good to brush the operation aside lightly. Yet the reports of failures from numerous sources have been such as to cause new methods to be sought and tried, a sure indication of inadequacy.

The excision of the ulcer seems to be the least logical of all surgical procedures. The removal of the local lesion may usually be more easily managed by the internist. Removal of the lesion with gastrojejunostomy adds little to the value of the latter operation. Removal with pyloroplasty seems rather more logical than with gastrojejunostomy, since neutralization of stomach contents and easy gastric emptying are accomplished with less distortion of normal relations. But it is based on the assumption that these are the factors in ulcer and we have no knowledge that they are.

The surgical treatment of lesser curvature ulcers has been on a remarkably poor basis. Wide excision of any type causes a deformity and probably a motor insufficiency entirely incompatible with satisfactory function. With the ulcer background untouched, the recur-

rence of the ulcer must be expected. The limited "cautery excision" of Balfour is a neat and safe operation, causing a minimal functional loss but again does nothing toward preventing recurrence. That is, a recurrence of the ulcer; the ulcer disease does not recur, it is not removed. Above all, limited local excision in lesser curvature ulcers must be a hazardous risk for the patient of carcinoma bearing age, and this begins fairly early in life. Often carcinoma cannot be differentiated from ulcer even in direct examination. Local removal seems most inadequate.

My criticism of all the conservative operations for peptic ulcer of both lesser curvature and duodenum is that while favorably modifying local conditions and in some cases removing the ulcer, the ulcer background is untouched; the cause persists and the ulcer area remains. Recurrence of the local lesion is to be expected and actually occurs in too great a proportion of cases to be satisfactory. The conservative surgical treatment of a peptic ulcer has little more effect on the disease basis than a protective ointment applied to a gummatous ulcer of the shin bone on the underlying syphilis.

Practically all peptic ulcers lie within a limited area of the stomach and duodenum. This area includes the lesser curvature of the stomach and the first portion of the duodenum. Very few ulcers occur elsewhere in stomach or duodenum. This is the ulcer bearing area. Whatever the cause of ulcer, it seems to produce its effect here almost entirely.

There is a rather general tendency among continental surgeons to do a wide resection of the stomach, removing this area of the stomach proper and the first portion of the duodenum. The extent of the resection varies somewhat. Finsterer includes the entire area distal to a line parallel with the long axis of the body, from a point just to the right of the entrance of the oesophagus. Others are less radical, some doing little more than an antrectomy. When a duodenal ulcer penetrates the pancreas, Finsterer suggests leaving it behind, making the transection of the duodenum proximal to the ulcer.

My own feeling is that permanent results depend upon a wide resection. Following Finsterer in a general way, I aim to remove the distal half of the stomach or more and include the first portion of the duodenum and anastomose the end of the stomach to the side of the jejunum. With the removal of the entire area,

whatever the cause of the ulcer may be, it seems practically unable to produce ulcer elsewhere. The recurrence of ulcer after a wide gastric resection is rare enough to suggest some error in technique, most likely too limited a resection or spur formation at the new stoma. A disproportionate number of recurrences seems to have been reported in America. This can probably be accounted for by the fact that but few American surgeons are doing the radical operation for ulcer. The recurrences represent the early work of many operators, each with limited experience.

Wide gastric resection is undeniably an operation of the first magnitude. It is not to be considered lightly and I cannot advise it lightly. But peptic ulcer is a serious lesion, requiring serious attention. The conservative operations that fail to cure it add greatly to its seriousness and to the mortality of secondary operations.

SUMMARY

The peptic ulcer, whether of stomach or duodenum, is merely the local result of an entirely unknown underlying cause. Its removal or local treatment leaves the cause, the underlying disease process, untouched. Wide gastric resection aims to remove the area in which ulcer can recur. The practical results have been excellent.

RECOGNITION AND TREATMENT OF THORACIC SUPPURATIONS OF PULMONARY ORIGIN

(Continued from Page 211)

16 single stage lobectomies with three deaths (18.7 per cent). Alexander recently reported a new two-stage method for the performance of lobectomy in bronchiectasis which he has done in 12 cases with two deaths (13.3 per cent).

Unfortunately not all the cases that survive lobectomy are cured because of the incomplete removal of diseased bronchi. Those who are not entirely cured, however, are almost uniformly definitely improved.

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Roentgen Diagnosis as a Factor in Preventive Medicine*

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A FRIEND of mine who is a general practitioner in a small town in Minnesota and has a very large practice was in my office some time ago and we were reading films. The first case which I will show you came up, and I took occasion to call his attention to the terrible neglect with which this child had been treated by a half a dozen different physicians and he said he thought that the trouble with many of us, especially people who were educated some years ago, was that we were not X-ray minded. It isn't difficult to make an X-ray diagnosis on many cases, but there is an unfortunate tendency not to use X-ray examinations sufficiently under certain circumstances.

I am going to try to show you a few of the conditions wherein X-ray examination may be very effective in early diagnosis, and in that way prevent the later results of disease.

The first case is a foreign body in the lung, then will follow some cases of tuberculosis, some of the stomach and some conditions in the bone. As I said before, if I were to try to cover all diseases which are amenable to X-ray diagnosis in the early stage, it would take the whole afternoon and I probably wouldn't finish even then. I just want to call your attention to a few of these which are rather striking examples. Perhaps tuberculosis stands out as the most important of the whole group. Nothing will respond better, perhaps, to treatment, in the vast majority of cases, than pulmonary tuberculosis if treatment is instituted at a relatively early stage. I know of no other method than skin tests, which in some respects as I will point out are not entirely satisfactory, by which tuberculosis can be diagnosed at such an early stage in its course as by adequate X-ray examination in good hands.

(Slide) This first case is a very striking example of the type of thing I was speaking of. Here was a young child whose parents brought her to a physician because she had a cough which had been present for several weeks. It got increasingly worse. The first doctor who saw her thought she had whooping cough, perhaps quite a justifiable assumption. He watched her for a few weeks, and as is commonly the

case the parents went to another doctor. He thought she had bronchitis and gave her some medicine for it. They went to a third doctor, a fourth one, and so on until someone conceived of the bright idea of making an X-ray examination of the chest, which revealed this hobnail in the bronchus, which the child had aspirated. The child doesn't know that it has aspirated anything, and if it does know it is not able to tell. If X-ray examination had been made the first time, we probably would not have this large suppurating lower portion of the right lung. After removal of the foreign body that began to clear up, but a permanent bronchiectasis remains as the result of the fact that that foreign body was allowed to stay in the bronchus for six or seven months. In anyone's hands that would have been perfectly obvious on X-ray examination.

(Slide) In the case of tuberculosis we have to consider a number of things. This illustrates very aptly the various forms of tuberculosis that we may see in the lungs in any individual. Here is a typical picture of a primary focus, a childhood lesion which is calcified and which produced these typical tubercles. There is a very definite and typical fibroid adult lesion in the apex on that side. I show you all of these to bring out the various types of tuberculosis and what we are trying to accomplish by X-ray diagnosis.

(Slide) Here is a typical childhood lesion in a young child. This is in the active stage when tuberculosis is really in the stage of pneumonia.

(Slide) Here is one in which the glands are markedly involved, typical childhood glandular type of tuberculosis, also in the active stage, with a good deal of parenchymal involvement.

How early can we make these diagnoses on X-ray examinations? These children rarely have any marked symptoms unless the disease is very extensive. A child with a lesion as large as the first one I showed you can walk around and not know it is sick at all. The parents may overlook it completely. The result is that they almost invariably come after the disease is established.

(Slide) We have been able, however, in a few cases to get some idea as to how quickly after

*Read before the South Dakota State Medical Association at Watertown, June 20, 1932.

the onset of the infection diagnosis can be made. We have been studying at the University a large number of students in whom routine skin tests have been made, tuberculin skin tests; in all the positive reactors, X-ray examination is made. In the medical students, however, we did another thing; we made X-ray examinations routinely regardless of whether the individual had a positive or a negative reaction. That has given us, over a period of four years, a rather large number of films to compare. This is a medical student, a senior at this time, with a very typical picture of normal lungs. There is absolutely no evidence that we can make out on X-ray examination of any pathology in those lungs. He has no symptoms at all, this is purely a routine examination.

Then he has service in a tuberculosis sanitarium. (At this time his Mantoux test is entirely negative.) When he gets through with that service we re-examine him and find he is still negative to X-ray examination. A few weeks later, however, his skin test becomes positive, and about six weeks after that we find these very clear-cut and typical lesions of tuberculosis in both upper lobes. We are practically certain (and the skin test is quite reliable in that respect at least as a negative thing) that he had no infection before he entered the sanitarium, and we have this about two months after his entrance, so we can say that within two months at most, perhaps even less, we are able to demonstrate the evidences of tuberculous infection within the lung. That is pretty fast and indicates to some extent how accurate this procedure may be under good circumstances. This boy had no symptoms. He took his temperature for a while, and he had no temperature, he had no physical findings, and he was examined over and over again and nothing was found. He continued to work and was rather skeptical of whether or not he had any real lesion. Then after another six weeks he began to run a temperature of 99.2 to 99.4 in the afternoon, and at this time we see a distinct increase in the size of the lesion; it has spread down into the area, taking now a characteristic course, proving that it is tuberculosis, and indicating that in this particular instance (and we have quite a number of the same type) the X-ray findings actually precede any evidences that the patient may have subjectively of tuberculosis. That is not true all the time, of course. Most of the time the subjective symptoms precede both the X-ray findings and the physical findings.

I cite this to illustrate how accurate this method

may be in the prevention of the end results of tuberculosis.

(Slide) Here is another boy of almost the same type: negative Mantoux test, service in the sanitarium, returned from the sanitarium and has a cold, and comes in to have his chest X-rayed. We found this very tiny lesion to which we were inclined to pay no attention at the time. A few weeks later another skin test was done, it was positive, and about four weeks later we have a very typical lesion in the apex, which you see coming down as dense bands running toward the hilum and extending just a little below the clavicle involving this whole area. We have followed that for about four months. It has increased a little, and as in the other cases he begins to develop a temperature and shows clear-cut evidences from a symptomatic standpoint of tuberculosis, although at no time has he, or have most of our cases had any physical findings whatsoever.

(Slide) Pleurisy with effusion is a similar case in point. Oftentimes the first sign of a tuberculosis is a pleurisy, and under those circumstances X-ray examination may be extremely important in establishing this at an early stage. Here is a boy who comes in with a pain in his left side. He has no physical findings at this time; he just has pain. It is thought that he has some type of pleurisy. An ordinary film is made in the usual upright position. He has a little tag on the diaphragm here, but no evidence of fluid. We put him in the left lateral decubitus and we see evidence of fluid, perhaps not more than 150cc., but sufficient to give a definite diagnosis. There are no physical findings at all, but this X-ray examination gives us definite findings indicating the presence of a pleurisy and permitting active treatment to be entered at once. That of course does not prove it is tuberculous pleurisy, although the other collateral findings may establish that.

In the stomach we have a somewhat different situation. Carcinoma of the stomach is an extremely important thing so far as mortality is concerned. About thirty to thirty-five per cent of the deaths from carcinoma anywhere in the body are due to carcinoma of the stomach. That is an extremely important factor in mortality in individuals beyond the age of 45.

It is very important, if we can, to establish some signs of carcinoma at a stage when it may be possible to operate upon these patients successfully. At the present time, of course, surgical treatment of carcinoma is strikingly unsuccessful, mostly because of the fact that the

lesions are relatively inaccessible. It is possible for us in some instances, at least, to diagnose a lesion which probably is a progenitor of carcinoma. These lesions come probably under two headings. One is what has been called a hypertrophic gastritis, representing a swollen, edematous, inflamed mucous membrane of the stomach, sometimes generalized, but often, as in this case, (slide) localized to one particular portion of the stomach. You can see here what looks like a large irregular filling defect on the greater curvature. This is another degree of the same thing, apparently undermining that point, very ragged and irregular, yet on careful manipulation we find that portion of the stomach wall is entirely flexible and peristalsis passes through it without any difficulty, in other words that there is no infiltration into the muscularis of the stomach, which is good evidence that carcinoma is not yet present, although this type of lesion without a doubt is one of the precursors of carcinoma and as such it is important to determine its presence when we can.

Many of these patients have very vague symptoms, and it is very difficult to put your finger on the type of pathology they may have from a description of their symptoms. The physical findings are nil. Some of them have hardly any symptoms at all, and yet many of these cases have been traced into a development either of benign tumors, polypi, adenomata, or carcinoma.

(Slide) Here is another one of the same type, a much more diffuse lesion, showing the same type of irregular, ragged appearance, which again is not due to carcinoma as demonstrated by the fact that peristalsis passes through and the walls are easily manipulated. These findings are brought out best by the use of pressure and a small amount of barium so that the stomach is not over-distended.

This sort of thing may pass over into or be associated with a more individual type of lesion which is well shown here. (Slide) Here is the outline of the stomach, the lesser curvature, the pylorus, the duodenum, and here you see a sharply defined defect right in the middle of the stomach. This was a young man of 30, who came in with symptoms very suggestive of an acute abdominal condition, perhaps ruptured ulcer it was thought, and we gave him this barium to demonstrate the presence of an ulcer, and somewhat to our surprise found this typical filling defect which was the only thing we were able to find to account for his symptoms. That is a typical picture of a benign polyp of the stomach. These sometimes give symptoms, but frequently

hardly any. They are likely to develop into adenocarcinoma, and it is likely that ten per cent of the adenocarcinoma we see develop from them. It is possible that many more do.

(Slide) Here is another of a somewhat different type. You can see a large tumor with fine markings running through it, a typical papilloma with many papillary projections. In this you can see there are three tumors present, this being the largest one and the other two being rather flat and not obliterating the whole lumen of the stomach. These are characteristic benign lesions; this case has been operated on and the tumors removed. In this case they were giving a lot of symptoms. They were removed on the assumption that these tumors will develop into adenocarcinoma.

(Slide) This case somewhat bears out our idea. Here is a patient who came in with rather vague symptoms which were thought to be due to gall-bladder disease or carcinoma of the stomach. We examined him and found this one large polyp, and perhaps another smaller one below. He was operated on outside and this alone was removed. It was removed locally; resection of the stomach was not done. Now he is back with four or five of these and some infiltration of the stomach wall and what certainly looks like malignancy of the stomach.

(Slide) Here is another very striking case which illustrates how important it is to pick up these benign lesions and do something about them before they have become malignant. This man came in with some symptoms of gastric hemorrhage. He was rather pale and had had rather profuse hemorrhage from the stomach. Otherwise there was very little to be found. He had not lost any weight. He had relatively little pain in his stomach. Here is the lesser curvature, there the greater, and in the middle third of the stomach you can see these three or four rounded, sharply defined filling defects not infiltrating the surrounding area, and we were able to trace the peristalsis through that area very well. He refused operation at that time but came back nine months later with this finding. You can see these four typical defects very beautifully, but in addition now a characteristic infiltration of the wall, an absence of peristalsis through this area; it had lost its flexibility, and we felt definitely that malignant infiltration was present. He was resected and the specimen showed clearly this combination of lesions, several benign ones, and neighboring them an adenocarcinoma which had definitely infiltrated into the muscularis and presents about as adequate proof as is possible

of the malignant degeneration of these polypi.

(Slide) I have a few pictures of bones to illustrate the same point of view in an attempt to determine lesions at an early stage by an X-ray examination.

Here is a child with multiple benign congenital exostoses. You can see them projecting off the lower end of the femur, the tibia, and he has them in several other parts of the body. These are clearly benign. You can see how sharply defined they are. There is absence of infiltration into the surrounding tissues and absence of radiating spicules of bone, all the things that indicate a benign bone tumor. But we know that about five or ten per cent of these tumors degenerate and become malignant. It is well for us to know that they are there. Of course it is not very feasible and one would not propose to do an amputation for a benign lesion of that kind, and 90 per cent of them perhaps remain localized in this fashion. But if you know that they are there and any new symptoms develop, repeated X-ray examination may develop for you the findings of malignant degeneration.

(Slide) This is a case that comes in after having received an injury to the side of the leg. The boy has a little pain and practically nothing else. There is very little to be palpated and he has been treated for a few weeks for rheumatism and for such things as that, the injury not being of sufficient importance to have aroused any comment. When he comes in, however, we are able to demonstrate, where the arrow points, just a little raising up of the periosteum. In the original film there are a few transverse spicules which project out into the soft tissues, obviously invading them, and representing a clear-cut picture of an osteogenic sarcoma in about as early a stage as one can demonstrate it. The history is of not more than six weeks standing, and it is probable the tumor is not very much more than that. If we can ever cure sarcoma of the bone—and of course there is a large IF there—this is the type of case we will cure when we pick it up at that stage of the game. At that time amputation may be of some effect, or perhaps direct X-ray treatment. If sarcoma is seen at a later stage it is almost useless to do anything with it.

(Slide) Here is another of the same type, except that it involves the lower end of the fibula. This child had a history of about eight weeks' standing. He had received an injury which had been passed off and no X-ray examination was made. In many of these cases an X-ray examination would show the tumor was already there,

of course. Later on one of the doctors who was treating him out in the country made an X-ray examination and developed this distinct lesion and he was sent to the hospital. Again we see a very localized tumor involving the lower end of the fibula, lifting up the periosteum with destruction of bone, and some transverse spicules extending out into the soft tissues. There again is a very apt case for treatment, because it has been diagnosed at a relatively early stage.

(Slide) Just a few films of the spine to illustrate once more how certain cases can have X-ray examination with extreme benefit in making an early diagnosis where early diagnosis is of importance. Here is a patient who comes in with pain in the back, just an ordinary sort of pain that hundreds of people who come to your office have, but perhaps a little more localized than usual, a little more tender in one area. Examination shows nothing but this little fusiform—shaped shadow in the lower end of the thoracic spine. This is a typical picture of perivertebral abscess that occurs with tuberculosis of the spine and osteomyelitis. In tuberculosis of the spine we may get a perivertebral abscess giving a distinct shadow at a time when the vertebrae themselves appear to be perfectly normal and would be passed up in the ordinary course of events on X-ray examination.

(Slide) Here is a lateral view in the same case. All you see is a trifle of narrowing at the intervertebral disk. That patient clearly had tuberculosis of the spine, as later events proved, diagnosed at a time when treatment prevents extension of the process.

(Slide) Here is another, except that the findings are a little more striking than in the previous case. It has advanced a little farther, but it is still found in a very early stage so far as the symptoms of the patient are concerned, and at a time when treatment may still be very effective without any resultant deformities. (Applause.)

PRESIDENT BATES: We will now adjourn the meeting over to the hotel and continue with demonstrations of X-rays.

X-RAY DEMONSTRATIONS

DR. LEO G. RIGLER: A case of congenital deformity of the spine in a young child. This is a very important thing to know about. I saw a case like this some time ago in a youngster of 10 in which there was a scoliosis developing. They took her to a doctor and he made a diagnosis of tuberculosis of the spine, and she was sent to a tuberculosis sanatorium. This is a typical deformity of the spine with an intercalated vertebra at this point. It produces a scoliosis of the spine which comes over this way. Often you will find they have only eleven ribs on one side and twelve on the other, which means

not an intercalated vertebra, but a half vertebra on one side. In this case there are two halves, which produce this scoliotic deformity. It is important to know about this, because as a general rule this type of deformity tends to go on, and the minute the child gets to walking you find it is beginning to bend over. The only thing to do is a spinal fusion at the point of weakness if they begin to develop a sufficiently marked angle of the spine.

QUESTION: *Could That Be Removed?*

DR. RIGLER: I think you would remove enough lamina so you would have to do a fusion anyway. A friend of mine came in with his boy who was thought to have congenital heart disease. In the course of the examination of the heart we got a little too heavy exposure, as you sometimes do, and could see the spine, and there was one of those hemivertebrae, and we had not noticed anything on the boy at all. We did notice that the father was hunched over. I had known him as an intern, and he said he knew he had had it. We laid him down and took a film of him, and he had the same thing, a familial tendency.

You can see the kyphos this child is beginning to develop now. Many of the kypho-scolioses that we see are associated with this sort of thing.

This case was submitted by Dr. Sherwood.

DR. E. W. JONES (Mitchell): This is a farmer, aged 40, who came to my office. He had been treated for six weeks for typhoid fever, but gave a history of illness since February, 1931. This was in August, 1931. After examination I made a diagnosis of primary carcinoma of the lung, and I sent him to the clinic up at Rochester for lung surgery. Vinson went into the bronchus with a bronchoscope and found a lot of inflammatory tissue. By the way, they had made a diagnosis of carcinoma of the lung, and this was their routine examination. He pulled out that tissue, and it looked carcinomatous, but under the microscope it was inflammatory. He went in a day or two later and got some more of it, and it was also inflammatory. They sent him home for six weeks to report six weeks later, and one day he had a severe coughing spell and coughed up a pulmonary calculus with a lot of pus and some blood, and a week or so later he came down to me and I took a picture of his chest. That was seven weeks after the first diagnosis. The stone I sent up to Vinson.

DR. RIGLER: Had he spit up any blood?

DR. JONES: There was no history of any blood. There was as small amount of sputum, never exceeding 30 to 60 cc. He had a temperature as high as 100. He had lost a lot of weight, from 165 down to 136. He immediately gained back the weight and is now farming 400 acres of land.

DR. RIGLER: When you see a film like that there are a number of possibilities to consider. One thinks of a tuberculous pneumonia very early, especially in view of the fact that you see the interlobar fissure, which is also shown here, is much higher than it normally should be. That means that a shrinking process of the lung must have been taking place for some period of time. That brought the interlobar fissure up as the upper lobe dim-

inished in size. That goes very well with a tuberculous pneumonia of the fibroid type. An ordinary unresolved pneumonia can occur which will do exactly the same sort of thing. As a general rule when carcinoma develops to that size you have much more atelectasis than that, so you get the heart and the trachea pulled over to the side of the lesion because almost complete obstruction occurs at that time.

It is difficult to rule out a carcinoma. I have never seen a case of pulmonary calculus of that type in a bronchus before. Any granulation tissue in the bronchus could do the same thing. This thickening of the pleura may remain a permanent thing. You can see the band of interlobar pleura coming across here. That whole upper lobe is shrunk enough to bring it up.

DR. JONES: This is a woman 50 years old, a heavy diabetic for a period of seven or eight years so far as we know. In April she felt pain in her chest. I thought there was a little pleural effusion there, but I have never been able to demonstrate it. There was a lot of cough, and she finally improved a little. Then she came into the hospital about two and a half weeks ago, losing considerable weight and coughing a great deal, but no sputum. She was running a temperature as high as 102, blood sugar 0.28, urinary sugar 4 plus. She would not accept regular diabetic treatment. I had the hospital make a plate of her chest, and I thought I was dealing with a bronchial pneumonia. I finally coaxed her to get a little sputum, and I found it loaded with tubercle bacilli. I am starting collapse therapy on her, and you can see the lung border. She has had about 600 cc.

DR. RIGLER: It is rather typical of diabetics to develop that. It is striking that you have so much on one side. With ordinary chronic tuberculosis you would not get that much involvement on one side without involvement on the other, but there just hasn't been opportunity enough to aspirate tubercle bacilli to the other side.

DR. JONES: I am not going to give an history on the next case except a history of two falls, striking on the back.

DR. RIGLER: These lower back things are often the most difficult things to analyze. There are so many things that may occur in the lower back. What looks like a separation of the sacroiliac joint here is a perfectly normal thing for this particular individual; you see the same thing, practically, on the opposite side. You can get what appears to be a wide sacroiliac joint by the slightest rotation of the patient on the table. One has to be very, very cautious in the interpretation of things of that kind. The fifth lumbar vertebra is almost always much smaller than the other, or very likely is going to be deformed. If you look at the fifth lumbar vertebra in the skeleton you find the body is smaller and the lamina is much smaller, and we get these irregularities of appearance. Here, however, there is what looks like a little cystic degeneration in the pedicle. The lateral view doesn't show anything at all. We always look very carefully to see if a spondylolisthesis or a lumbosacral slip has occurred. There seems to be nothing of that sort. There is a local rarefaction at this point, which resembles a cystic disease more than any-

thing else. Once in a great while we see a tuberculosis here, which is unusual because tuberculosis usually starts in the body of the vertebra and not in the lamina. I hardly believe that had anything to do with the injury.

DR. JONES: The history of the case is that she had lots of pain. This was taken about three weeks after the pain began after the history of two severe falls, lighting on the back and hips, and she almost became helpless with contracture of the leg, gradually pulling up of the leg on that side. I made a sort of weak diagnosis there of an osteomyelitis of the fifth lumbar vertebra, and I never could get anybody to agree with me. She finally decided she would go somewhere else. She went to a clinic, the uterus and tubes were removed, and she was sent back. A few days after she got back an abscess was opened in the groin and that was called a perinephritic abscess, and later the kidney was opened and nothing was found. She drained and drained and drained until she became a mere shadow. She came to autopsy and we found an osteomyelitis of the fifth lumbar and the first and second segments of the sacrum. The bone was not through the decalcifying process yet, so I am unable to give you the pathology that was found.

DR. RIGLER: That is a very clever diagnosis. We rarely see osteomyelitis of the spine at such an early stage as that where only this small area of rarefaction is present.

DR. JONES: This is a case of a woman, aged 37, in whom the pleural cavity and the abdomen are involved. I have aspirated from the pleural cavity and from the abdomen considerably over 1,000 pounds of liquid. She has been aspirated approximately 100 times. At the last aspiration we were unable to get very much out of the abdomen and very little out of the chest because of the terrific glandular enlargement. I think she is getting a pericardial involvement. She has had two courses of deep therapy.

DR. RIGLER: It hasn't touched her at all?

DR. JONES: Not at all.

DR. RIGLER: I think one could throw out either lymphosarcoma or Hodgkin's, because almost all of them would respond to some extent. The striking thing is that after this last aspiration there is a mass in the lower portion of the right mediastinum. That is quite an unusual location for Hodgkin's or lymphosarcoma to start. It might even be a carcinoma, although that is very unlikely.

DR. JONES: Three guinea pigs failed to produce any tuberculosis. She is gradually going out now with a cardiac involvement.

DR. RIGLER: Has she been fluoroscoped? I wonder if that really is heart or whether it isn't part of the tumor mass projecting over the heart. It is so lobulated in appearance; pericardial effusion almost always gives you a comparatively smooth border, the fluid irons out the pericardium to take on a comparatively regular border. That is one of the ways we distinguish between the normal curves of the heart and an effusion. Here we have a lobulated appearance which is typical of any glandular enlargement which tends to take on that appearance. Hodgkin's does that.

DR. JONES: She has had six points of entry in the front, six in the back, with heavy therapy on two different occasions.

DR. RIGLER: If Hodgkin's has been treated a long time and doesn't respond, it doesn't mean so much, but the first time it is treated there should be some response if it is a Hodgkin's. The same thing to a lesser extent is true of lymphosarcoma. There are these unusual sarcomas of the chest which occur and which grow like anything—mediastinal sarcomas—which don't respond to anything at all. It perhaps is that.

DR. A. A. McLAURIN (Pierre): This is a boy 24 years old who fell and lit on his shoulder.

DR. RIGLER: You can see the gradual development of atrophy of these bones, but I see no evidence of fracture. His injury is very likely a soft tissue one of some kind, but certainly those are very good films and every detail of bone is brought out beautifully, and I wouldn't feel there is any possibility of any bone injury. He is holding his shoulder still so there must be something the matter with it, no doubt a soft tissue injury.

DR. McLAURIN: This woman, 42, is the wife of a physician, a graduate nurse, diagnosed tuberculosis about a year after she graduated from training. She has one child 14 years old. She has recurrent attacks of acute respiratory trouble and coughs up blood, sometimes enough to be quite noticeable. I have been to see her a number of times when she has had a hemorrhage, and have found her general surroundings pretty well sprinkled with blood, without much question of where it comes from. There is marked limitation of movement of the left side of the chest, but she goes right along; she will have a hemorrhage today and three days later you will see her at a dance or putting on an afternoon tea. The sputum has always been negative.

DR. RIGLER: When you hear of hemorrhage of the lung there are two things most common. Most common is bronchiectasis, and second most common is tuberculosis. As far as we can see that is a negative chest. The only thing you always have to remember is that there are certain silent areas in a film. One of those is behind the heart and another is below the dome of the diaphragm. Where a case is persistently having hemorrhages and you don't find anything, those are the places to look. It is not so difficult to look behind the heart. We lay the patient on his back, often on a Bucky diaphragm, and make a film. We expose it rather heavily and shoot right through the shadow of the heart. By lying on the back the heart is the farthest away from the film so the shadow is diffused. I have been very much embarrassed to make a negative report and have the clinician come back and show me where the rales were behind the heart on the left side.

Another place is this one below the dome of the diaphragm. I would give her some iodized oil in the bronchi and then you have to use a special technic; you can make a very heavy exposure, and anything that is present there in the form of an abscess or a bronchiectatic cavity will show up. If she had tuberculosis, with that hemorrhage she would have a positive sputum at

(Continued on Page 226)

Prostatectomy and Transurethral Prostatic Resection*

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*"Be not the first by whom the new is tried,
Nor yet the last to lay the old aside."
—Pope.*

UROLOGICAL surgery, which has long been one of the most (if not the most) exact of the surgical specialties, has recently received new impetus through the addition of two new and valuable procedures— intravenous pyelography and transurethral prostatic resection. Each of these methods has its recognized and unquestioned merits. Yet, each has its very definite limitations and its dangers. It is well known that in all fields of endeavor the pendulum tends to swing too far. In our over-enthusiasm we are inclined to overlook the complications and the pitfalls. In order properly to evaluate any given new surgical procedure, it is necessary that we use as a basis an accurate comparison of the complications, the mortality rates, and the immediate and the *ultimate* functional results of the new and the old methods.

An example of excess swings of the pendulum in both directions, due to over-enthusiasm (later corrected by over-caution) is afforded by the history of the changes in the attitude of the profession toward nephropexy. During the decade between 1910 and 1920 nephropexy was a fashionable procedure. Kidneys were suspended upon the slightest provocation. A palpable kidney, with a pelvic capacity in excess of several cc. was considered to be sufficient operative indication. Then the correction set in. Gradually the harmfulness of this procedure, and its futility unless properly indicated, were recognized. Whereas, the time was when one group of extremists claimed that *all* floating kidneys should be suspended, the time came when another group of extremists claimed that *none* should be suspended. Obviously, neither of these views is correct. There is a middle road for the conservative to follow. As the years have passed, the operation of nephropexy has come to be properly evaluated. Those who are open-minded recognize that there is a well defined group of cases, with hydronephrosis, ureteral obstruction and colic

secondary to nephroptosis, in which nephropexy is an exceedingly valuable procedure, offering complete and permanent symptomatic relief. And so it is with all new procedures. Time, and impartial analysis of results, will render the verdict.

DEFINITION

Transurethral prostatic resection may be described as the removal, bit by bit, by means of an electric cutting current, through an endoscopic tube (during one or more sittings) of a sufficient amount of the obstructing prostatic tissue to permit the patient to empty the bladder. Very complicated and elaborate electric equipment is required, in order to provide both a cutting current to remove the tissue and a coagulating current to control the hemorrhage. The mechanism of the modified endoscope (or "resectoscope") employed for this purpose, provides a small wire loop 7 mm. in diameter, which, through a system of lever control, makes an excursion of 27 mm. in length, cutting out a piece of prostatic tissue of approximately corresponding size. A large number of cuts may be made at one sitting, permitting the removal of 5 or 10 grams of prostatic tissue, or considerably more. As is necessary, the coagulating current is switched on to control individual bleeding points. Through a gradual process of evolution, this instrument has reached a stage approaching mechanical perfection, so that in skillful hands there is no limit to the number of grams of tissue which may be removed. Furthermore, the excellent vision afforded through the more modern lens systems permits this tissue to be removed with great exactness, and, together with the coagulation current, permits the control of immediate hemorrhage in a thoroughly satisfactory manner.

A detailed description of the development or evolution of this mechanical equipment would be here out of place. A number of pioneers have contributed. Suffice it to state that the recent wide recognition of prostatic resection has been due largely to the mechanical ingenuity and enthusiastic publications of T. M. Davis¹. The McCarthy² equipment functions up-

*Read before the Sioux Valley Medical Association at Sioux City, Iowa, January 24, 1933.

†From the University of Nebraska College of Medicine.

on somewhat similar principles. Caulk³, with his cautery punch, modified from Young's prostatic bar exerciser, has been obtaining excellent results for a number of years. The method advocated and successfully employed by Bumpus⁴, makes use of the cold punch (or circular cutting knife) principle, preceded by electric coagulation of the tissue to be excised, in order to provide hemostasis. Of these three general methods (the electric cutting loop, the cautery punch and the cold punch, preceded by coagulation) none is fool-proof, and each requires a great deal of skill as well as familiarity with instrumental procedures in the prostatic urethra. In fact, no one has been able to duplicate, or even approach, the results which have unquestionably been attained by both Caulk and Bumpus, each with his own special method.

This paper is written in an attempt to give a fair and impartial answer (insofar as our limited knowledge permits) to the question which is daily asked, "What do you think of prostatic resection?" An answer to this question must necessarily include a summary of the opinions of others.

PERSONAL EXPERIENCE WITH PROSTATIC RESECTION

We have employed the transurethral prostatic resection method in a limited number of selected cases during recent months. Results in general have been satisfactory, and in a few cases, highly gratifying. We have confined our efforts in this field particularly to fibrous contractions of the vesical orifice, median prostatic bars, moderately hypertrophied median prostatic lobes, and to prostatic carcinoma. It is not too early to state that in cases of prostatic carcinoma particularly transurethral resection seems to offer to the sufferer a method of relief hitherto not available. Whereas it is true that partial enucleation by the perineal route, in cases of advanced carcinoma of the prostate, may give gratifying and fairly prolonged satisfactory functional results, these patients (with prostatic malignancy) are peculiarly susceptible to post-operative fistula and unsatisfactory urinary control. Transurethral resection in these cases, however, provides a method for the removal of the obstructing tissue. Granting that this relief is only palliative, and perhaps only temporary, the value of this procedure (in cases of prostatic malignancy) is nevertheless not open to question.

We are not as yet prepared to express an

opinion as to the advisability of the resection method in cases of large hypertrophy.

THE ADVANTAGES OF PROSTATIC RESECTION

The enthusiastic advocates of resection claim as its chief advantage the decreased period of hospitalization, with consequent saving of time and expense. While the economic consideration is an important one (particularly to-day), there are obvious reasons why this consideration should not be paramount. A few days, or a few weeks, more or less in the hospital is not long as compared to eternity. By this we do not intend to imply that there are established facts indicating that either one or the other of these procedures is more hazardous. We believe, however, that it is hardly necessary to state that the economic factor is of secondary importance, as compared either with immediate risk or ultimate result. Furthermore, such saving of hospitalization as there is applies only to post-operative convalescence, since preliminary bladder drainage in these cases is just as essential as preceding prostatectomy. Alcock⁵ states, "these patients—were prepared as though they were to have prostatectomy."

In all fairness, however, those opposed to resection must acknowledge that the economic and time factors, although not paramount, are exceedingly important, both from the viewpoint of the patient, and from that of the charity hospital. To say nothing of the daily cost to the institution of each charity bed, the mere item covering the expense of surgical dressings used to take care of the urinary drainage runs into an amazing figure.

Another obvious advantage of the resection route is that the idea naturally appeals to the patient. From his viewpoint, prostatic resection is not a major procedure. Although the patient's opinion in this respect is fallacious, herein lies a distinct advantage, in that the borderline case, or the patient who is facing gradually increasing urinary obstruction, and who is reluctant to consent to prostatectomy, may be more easily persuaded to submit to the "non-operative" method of relief before a critical or dangerous stage has been reached.

Kretschmer⁶ cites "the elimination of shock" as an advantage of the transurethral route. The same applies to perineal prostatectomy under sacral block anesthesia. We have long since forgotten the word "shock" in this connection.

RESULTS IN PROSTATECTOMY

It is obvious that an accurate opinion con-

cerning the relative merits of the two procedures can have no sound basis other than a comparison of results. With this purpose we therefore submit a brief summary of results in prostatectomy in a series sufficiently large to permit reliable conclusions. This series which has been previously reported from time to time by one of us (Davis⁷) now totals 479 consecutive cases of perineal prostatectomy under sacral block anesthesia. Table I shows 12 deaths, or a 2.5% mortality rate, with 98.8% of these patients classifying themselves, upon questionnaire blanks, as well or improved. Whether or not we shall be able to duplicate or better this record by any other method, can be determined only by the lapse of a considerable period of time. We propose to find out. It is our purpose gradually to give the transurethral method a thorough trial, but we do not propose immediately and completely to abandon prostatectomy in favor of wholesale and indiscriminate employment of transurethral resection in all cases of prostatic obstruction.

TABLE I
Results in Perineal Prostatectomy

Total consecutive cases	479
Average age	70
Deaths	12
Mortality rate	2.5%
Late functional results	
Well	82.3%
Improved	16.5%
Unimproved	1.2%
Incontinence	
Complete	0
Moderate but definite	4
Slight or doubtful	5
Perineal urinary fistula	
Requiring secondary closure	7

The classification of late functional results as to well, improved, or unimproved, as shown in the above table, is based upon the patient's own voluntary opinion as expressed upon questionnaire blanks sent out at an interval of not less than four months following the operation.

THE MORTALITY RATE OF PROSTATIC RESECTION

The relative mortality rates of the two procedures is undetermined, and doubtless will remain so for a period of years. It is also true that these figures inevitably will vary widely in the hands of different operators, and that the bulk of the poorer records never will be reported. The same applies to ultimate functional results as well as to the immediate mortality rates, and to prostatectomy as well as to the transurethral method. With the sincere purpose of speeding up the answer to these moot questions, Alcock⁵ has adopted the transurethral resection method almost as a routine, and has recently reported results in a series of 175 cases, thus rendering an exceedingly valuable service.

One must not overlook the fact that prostatic resection, although requiring no external incision, is nevertheless a *major surgical pro-*

cedure, leaving an open sloughing surface with consequent possibilities of grave complications, due to sepsis, and to both immediate and secondary hemorrhage. Furthermore, the average prostatic resection is far more time-consuming, and is a far more trying and tedious procedure, from the viewpoint of both patient and surgeon, than the average prostatectomy under sacral block anesthesia. Referring to his first 50 resections, Alcock states, "Practically all of these patients showed post-operative reactions, and in over 60% of them the reactions were quite violent, as manifested by chills and temperature from 101° to 104° lasting from two to five days. Many of these patients were extremely sick." He adds, however, that later in the series, since he has acquired more skill and familiarity with the procedure, these reactions have become less conspicuous. With respect to mortality, Alcock has reported 20 deaths in his series of 175 which is equivalent to 11.3%. However, in reporting his deaths, Alcock has been so scrupulously honest and upright as perhaps to "lean backwards" a trifle. For instance, he has included not only *all* patients dying from *any* cause following prostatic resection, but also two patients dying during the preliminary preparation *preceding* prostatic resection. For this reason, these mortality figures may perhaps be somewhat unfair to prostatic resection. Alcock has classified his mortality as follows:

Deaths due to subsequent operations following resection failure	3
Deaths due to vascular accidents (such as coronary occlusion) following resection	3
Deaths due to other causes not related to the resection	3
Deaths following resection due to errors in technique and preparation	4
Deaths directly due to resection (sepsis and uremia)	5
Deaths occurring during preliminary drainage	2
Total	20
	(11.3%)

It is but fair to add that Alcock has noted a distinct decrease in his mortality as his skill and familiarity with the method have increased, as shown by the following:

	Deaths	Mortality Rate
1st 25 cases	7	28%
2nd 25 cases	5	20%
3rd 25 cases	2	8%
4th 25 cases	1	4%
5th 25 cases	1	4%
6th 25 cases	1	4%
Last 100 cases	5	5%

It is quite evident therefore that transurethral resection is a major surgical procedure which is far from free from risk. It is also obvious, however, that in skillful hands, the mortality rate of resection may be made to compare favorably with the better prostatectomy statistics. Alcock's decreasing mortality rate

affords convincing proof of the dangers inherent in this method in unskilled hands.

FUNCTION RESULTS OF PROSTATIC RESECTION

The final important subject for consideration has to do with functional results, both immediate and ultimate. It may be said that there seems to be no question that in general the immediate functional results of prostatic resection are satisfactory. It is true, however, that during the first two or three post-operative weeks, while the slough is separating and coming away, the patient is likely to pass through rather a trying and tedious period with symptoms corresponding to those of acute cystitis, and with varying degrees of residual urine. Alexander Randall⁸ has described this phase as follows:

"As regards resection; I find it dropping back into the position where the punch operation was previously used, with a little broader scope and probably with better ultimate results in cases of early commissural hypertrophy. We have had our complications, primary among which is the slow "urethral convalescence," and sometimes I wish I had done a prostatectomy, rather than cheer these fellows along the slow and tedious post-operative period, when signs and symptoms are disappointing to both patient and surgeon."

For obvious reasons, the question as to the ultimate functional results is not to be disposed of at the present writing. The procedure is too new. Referring to the value and to the future of prostatic resection, we quote in brief the following opinions:

Dr. Hugh H. Young⁹, Baltimore, Md.: "Any method that is to supplant perineal prostatectomy should be safer than perineal prostatectomy, and just as permanently curative.—The questions which time alone can answer are: What will be the ultimate results? How many will come to other operations later? How many will eventually require prostatectomy? What will be the actual mortality, including the four to six weeks after the operation during which the slough is separating?"

Dr. Hugh H. Young,¹⁰ Baltimore, Md.: "The reason that these modifications of the punch have had such a popularity recently, is because of the fearful mortality which many have had in their cases of prostatectomy. Those of us who do the perineal operation have had no such urge to quit prostatectomy.—If therefore, it is possible, by means of the perineal route, to enucleate all the adenomatous enlargement

with a very low mortality, why should we adopt for such cases an operation which is manifestly incomplete, partial, liable to recur, and which, in the hands of many, has already shown much higher mortality than perineal prostatectomy?—From all sides, we hear of deaths following prostatic resection which is now being used by men who are not urological surgeons and therefore delighted to find an office operation by which they may treat prostatic hypertrophy."

Dr. N. G. Alcock⁵, Iowa City, Iowa.: "So far as immediate results are concerned, I am perfectly satisfied with the method. Whether I continue to use it or not will depend upon what the ultimate outcome is, and that will be determined only by a very careful study of what has happened to these patients a year or two years after they are resected."

Dr. Arthur B. Cecil¹¹, Los Angeles, Calif.: "Whether prostatic resection will have any great advantage over prostatectomy, I really do not know. I am doubtful as to whether the death rate will be as low in the hands of anyone, and I am most doubtful as to whether the results will be as good."

Dr. J. R. Caulk³, St. Louis, Mo.: "Transurethral surgery is sure to have a more prominent place as time goes on, but care must be taken in its execution. It is a delicate task and entails considerable training, confidence in one's self and the adoption of every possible measure to insure safety through careful preliminary preparation, accurate surgical manipulations, and scrupulous after-care."

Dr. Herman C. Bumpus¹², Rochester, Minn.: "This study of 102 cases in which prostatic tissue was removed through the urethra five years ago because of urinary obstruction, would indicate that transurethral resection should, with the improvement in technique which has occurred in the last five years, be performed with less risk, less time spent in the hospital, and consequently with less expenditure of funds, with a final functional result equal in permanence to that usually obtained by prostatectomy."

Dr. Clyde W. Collings,¹³ New York City, N. Y.: "Small and moderate-sized prostatic obstructions may be efficiently relieved under direct vision by the high tension cutting current through the cysto-urethroscope. Because of instrumental difficulty and prolonged cystoscopic manipulation, marked enlargement had best be relieved by prostatectomy."

Dr. Wm. F. Braasch,¹⁴ Rochester, Minn.:

"Transurethral resection has come to stay. Whether it will entirely replace surgical prostatectomy remains to be seen. In the presence of large median and bilateral lobes, prostatectomy may be indicated. The last point I would emphasize is that transurethral surgery should be employed only by those who have had widespread experience in its use and not by near-urologists. It will never be a fool-proof procedure."

Dr. Herman L. Kretschmer,⁶ Chicago, Ill.: "Regarding the use of the instrument in very large prostates, I feel that very large prostates had better be removed surgically."

Dr. Herman L. Kretschmer,¹⁵ Chicago, Ill.: "This matter will not be settled until after an interval of about ten years."

Dr. Frank M. Phifer,¹⁶ Chicago, Ill.: "I remain an enthusiast on perineal surgery, and I am reluctant to make a change from a procedure that has given me such satisfactory results over a long period of time."

It is to be noted that the above opinions are far from unanimous; in fact, in some respects, these opinions represent divergent views, yet each of these observers is able and honest and of established reputation. Considering the newness of the procedure under discussion, however, and the revolutionary character of suggested change in surgical technique, it would be strange indeed were there other than marked discrepancy in opinion.

It is also to be noted that these opinions have certain trends in common. Whereas, these observers show wide variations in their enthusiasm for prostatic resection, each concedes a place to this procedure, each is inclined to be conservative in his judgment as to ultimate results, each shows a tendency to reserve the larger prostates for surgery, and each sounds a note of warning against the adoption of prostatic resection by the novice or the "near-urologist." The consensus of opinion would therefore seem to be that an interval of time will be necessary before the pendulum swings to its proper resting place.

COMMERCIALISM IN THE SURGICAL INSTRUMENT TRADE

A word concerning commercialism in the surgical instrument trade, as well as in the drug trade, is not here out of place. It is only too apparent, in a situation such as this, in which there is pending a country-wide adoption of a new procedure, that commercialism plays a major role. These electro-surgical

units are expensive. The sum total of profitable business involved in equipping the urological profession with these machines is tremendous. The prospective prostatic resectionist is bombarded by high-pressure sales literature, and besieged by clever salesmen, who have memorized a glib patter about the transurethral approach, such as to leave him (the surgeon) wondering whether there has been something lacking in his (the surgeon's) training. Cecil, in Los Angeles, writes, "I have been bewildered by the various instruments." The inevitable result of this commercial force will be the placing of large numbers of these electro-surgical units (some of them excellent, some of them not so excellent) over the country in hands, some of which are skillful and scrupulous, and some of which are not so skillful and not so scrupulous. It is only natural that the primary interest of the surgical instrument trade should be in sales volume, rather than in the qualities of a given electro-surgical unit, or in ultimate clinical results. Furthermore, there is an urge to peddle these instruments "right now," while the enthusiasm is at its height.

CONCLUSIONS

Transurethral prostatic resection, properly employed and in selected cases, is undoubtedly a useful and valuable procedure.

Majority opinion indicates that this procedure will partially replace, but will not supplant, prostatectomy.

What type and what percentage of obstructing prostates may be best removed by resection, and what type and percentage by prostatectomy, remains for the future to determine. These questions may be answered only by a fair and impartial analysis of end results.

The immediate results of prostatic resection, in selected cases, seem to be satisfactory. The ultimate results of prostatic resection may be determined by the lapse of time only.

The chief advantage offered to the patient by the transurethral method is a decreased period of hospitalization. Preliminary drainage, preceding resection, however, is just as essential as before prostatectomy.

It seems doubtful whether, in the last analysis, the transurethral method, considering mortality rate, immediate functional results, and ultimate functional results, offers the patient as great a degree of assurance of

continued health and comfort as does perineal prostatectomy.

It is likely that the personal equation will come to be an important factor in answering these questions. Each must compare his own results. Whereas, in the hands of one individual, prostatectomy may give better results, in the hands of another, the opposite may be true.

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ROENTGEN DIAGNOSIS AS A FACTOR IN PREVENTIVE MEDICINE

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one time or another, whereas a bronchiectasis can go along beautifully and hemorrhage and hemorrhage and not have much else besides that.

It may be something entirely different, but I would guess it was something of that kind, and I would advise an iodized oil examination.

DR. McLAURIN: This man is about 58, a laboring man. He came in with a little cold and cough and was sent to the hospital. He is a bachelor. He was sent up to the X-ray department.

DR. RIGLER: How much time between the films?

DR. McLAURIN: Three months.

DR. RIGLER: Did he spit any blood?

DR. McLAURIN: No. He felt a little tired. He ran a temperature up to 100 occasionally. He had a little cough. There were no constant chest findings. He would have rales some days and some days not—in the front,

nothing in the back. You can very easily demonstrate this here.

DR. RIGLER: There are two striking things here. One is a density which is extending out apparently from the center upward, and the other is the fact that the heart is pulled over to the left side. You can see the trachea is pulled over a little, not much. What are the possibilities? Chronic pneumonia with some fibrosis is one, tuberculosis is another, carcinoma of the lung is a third. Having this, of course, we can practically rule out the chronic pneumonia because it doesn't go on and get worse. Tuberculosis may, but not chronic pneumonia. Tuberculosis seldom goes on to spread in that uniform way. It occurs in waves and it seldom would go as fast as that and increase to that extent. Tuberculosis does not very often give atelectasis in the relatively early stage. Carcinoma does. I would say the fact that it starts at the center and extends outward and would seem to infiltrate the lung is apparently evidence of a primary carcinoma. The absence of blood spitting would be a little against it.

Remember that carcinoma of the lung develops inflammatory lesions with it. That is one of the most common things that we find in carcinoma of the lung, that they get inflammatory lesions, they get abscesses, they flare up, the patient is terribly sick, the carcinoma gets well, seemingly, and then flares up again. That sort of thing happens, so I don't think that rules out the fact that it is a primary carcinoma at all.

DR. McLAURIN: Here is a man of 62 who came in because of a cough. He has a dry, non-productive, rather well spaced repeated cough, and it is there all the time he is awake. Physical examination is anything but positive. We X-rayed him and there is what we get. He was only in for 48 hours. He ran practically no temperature, no increase in pulse rate. We found that one shadow. It extends back, unlike the other one.

DR. RIGLER: You may think I am unusually obsessed with carcinoma of the lung, but we are seeing so very much more of it now.

QUESTION: About what age?

DR. Rigler: We have had a lot of young ones. People with carcinoma of the lungs are not as old as people with carcinoma of the prostate or the stomach. They are frequently in the thirties or the forties.

DR. McLAURIN: That man is 60.

DR. RIGLER: This is more likely to be a malignancy than tuberculosis which seldom starts in the center like that. It usually starts at the periphery and comes in, and seldom do you get a tuberculosis event in the most acute cases that are violently sick, with a lesion which is so extensive as that and so uniform. Usually a tuberculosis starts and spreads, and with each spread there is a difference in the age of the different lesions and therefore a difference in their appearance. (Applause.) I believe this is another carcinoma of the lung.

Throat Cultures and School Attendance

F. E. Harrington, M.D.

Commissioner of Health, Director of Hygiene
Minneapolis

DIPHThERIA as a disease is recognized by more or less characteristic symptoms which can be confirmed by laboratory findings. Swabbing of the throat with a small cotton swab and transferring the exudate thus collected to blood serum media is the process of procuring the specimen for laboratory examination. Such a specimen is incubated and stained smears made from it are examined under the microscope. In clinical diphtheria, finding the characteristic bacilli usually confirms the diagnosis.

The discovery of diphtheria bacilli in the throat or nose of persons not clinically ill is, from the public health standpoint, quite as important as the demonstration of the organisms in the throat or nose of those clinically ill. Usually persons suffering from diphtheria disease are ill and not running about. Mild disease, however, does not always restrict the patient. Bacteriological disease, however, presents either such mild symptoms, or the total absence of symptoms, that the patient or carrier is seldom restricted and becomes the source of infection to others. It is for this character of case that the culture method is used to discover the diphtheria bacilli in the throat or nose. Occasionally, but rarely, symptoms were present which could have been attributed to diphtheria infection, although their association with any disease process was remote. Sore throat, of course, is the most common of all the symptoms in diphtheria infection.

Children with sore throats attending school or returning to school after an absence may harbor diphtheria infection. In the absence of recognized clinical symptoms and the inability to discover by inspection, the recourse to the culture method is the only means of disclosing the existence of diphtheria bacilli in the air passages, throat or nose, of children attending school. Because of this and for the purpose of preventing as far as possible the spread of diphtheria infection, the Board of Education of Minneapolis requires a culture from the throat and nose of all children who are or have been complaining of, or suffering from a sore throat be submitted and examined before the child is

permitted to attend school. Such a rule covering upward of 100,000 children must of necessity be uniformly, fairly, and justly applied. Discrimination would defeat the very aim for which the rule was made.

No person with the unaided eye is able to see the presence or to pronounce the absence of the diphtheria bacilli. All children in school complaining of sore throat, or children returning to school having had sore throats either during their absence or as a reason for their absence are required to present a laboratory report from the Division of Public Health showing the absence of diphtheria bacilli from a culture taken at the time of school re-admission or during the existence of the sore throat. Such a culture can be taken and submitted to the laboratory by the physician in attendance upon a child, or upon request of the family. Should a child present himself at school for re-admission after an absence in which a sore throat has been one of the causes for the absence, and represent to the nurse that a throat culture has been taken, a negative report from the laboratory for that culture is all that is required to admit the child to school. In the absence of any such report it becomes the duty of the school nurse to apprehend such a child before his re-admission to his classes, procure the culture specimen, forward it to the laboratory, and send the child out of school until a negative report is received.

The existence of bacilli carriers in school groups in the absence of any manifestation at the time in the throat of the carrier may be the source of transmission of the infection to other children. During the school year 1927-28, 27,000 throat cultures were made in a effort to discover the presence of diphtheria bacilli. There were actually discovered 134 children harboring the diphtheria bacilli and presenting no definite clinical symptoms but attending school and exposing others. During the school year 1928-29, 27,000 cultures were submitted for examination, 80 of which proved positive for diphtheria bacilli; one of these was from a teacher. All of them were unsuspected diphtheria car-

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Meckel's Diverticulum With Volvulus and Gangrene of the Ileum*

M. A. Stern, M.D.
Sioux Falls, S. D.

MISTRESS A. A. Age 11. Previous health good, had always been a hardy, vigorous child. On Sept. 13, 1932, was awakened about 4 a. m., with severe cramps in lower abdomen. Vomited about one-half hour after onset of pain. Pain was cramp-like in character. The pains continued that night and the following day but the patient was treated by the parents with the ordinary home remedies. On Sept. 14th, about 10 a. m., the pain became less severe although vomiting continued. This day had a small bowel movement. About 5 p. m., patient was seen by the family physician and sent to the hospital arriving about 8 p. m., or about 40 hours from time of onset of illness.

Examination disclosed a well nourished girl, acutely ill. The nostrils were pinched, pulse 130, temperature 100.5. The tongue and skin were dry. No abnormal findings in the chest. The abdomen was only moderately rigid but was very tender to gentle palpation. Below the umbilicus and extending out to the lateral walls of the pelvis was a localized fluctuant swelling. The urine was normal, white cell count 11,500, 87 per cent of which were polymorphonuclears. A provisional diagnosis of ruptured appendix with localized abscess was made. Operation at once. A right rectus incision was made. On opening the abdomen from 300 to 500 cc. of bloody serous fluid escaped. Coils of gangrenous intestine presented. Upon delivery of the gut, it was noted that a pouch filled with fluid, and gangrenous, was hanging from the lower ileum. In the mesentery of the ileum were three distinct twists (much as an ovarian tumor twists on its pedicle). It was then clear that a Meckel's diverticulum had caused a volvulus of the ileum with about three and one-half feet of gangrenous bowel. Rapid resection and end to end anastomosis with Murphy button was done. Patient left the table in poor condition. On the fourth postoperative day a fistula developed which drained liquid contents profusely. On the seventh postoperative day the Murphy button passed the anus. During this time there was a troublesome diarrhea, six to eight liquid movements daily. On the tenth postoperative day the fistula began to close and was healed on the 16th postoperative day. Conva-

lescence was rapid and recovery complete. The resected specimen measured three feet one inch after being in fixative for three days. At the time of resection the loop of the bowel was very edematous and dripping blood and serum. A considerable amount of the total blood volume must have been contained in the loop of the obstructed bowel.

THROAT CULTURES AND SCHOOL ATTENDANCE

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riars. During the school year 1929-30, 27,000 cultures were submitted for examination of which number 57 proved positive for diphtheria bacilli, and again one of these was from a teacher. During the school year 1930-31, 26,000 cultures were taken and 40 of them were positive for diphtheria. In the school year 1931-32, 25,000 cultures were taken and 71 of them proved positive for diphtheria. These figures reflect the results of this procedure when compared with the figures for 1913-14 when 5.33 per cent of the cultures taken were positive for diphtheria bacilli. The prevalence of diphtheria in the school system as demonstrated by positive culture in the school year 1913-14 was 184 times the prevalence in the school year 1931-32.

These facts and figures justify the rule in requiring negative throat cultures from all students and school personnel with histories of sore throat before admission to classrooms. The burden of making these cultures has been thrown upon the Board of Education as a measure to restrict the introduction or spread of diphtheria infection in school. As a prevention such cultures should be made by physicians at the request of parents, or by physicians at the time of attendance upon children during an illness and before their return to school. If this cooperation were offered it would result in a saving of many days of school absence inflicted upon thousands of children for the purpose of safety for the masses and in an endeavor to detect the few who if permitted to attend school without culture would be a direct menace to the childhood of Minneapolis.

*Read before the Sioux Valley Staff.

Childhood Type of Tuberculosis in the Aged (Report of a Case)*

C. P. Aling, M.D.
Minneapolis

THE patient reported is a woman of 76 years, rather small of stature, and slight in build. She complains of hemorrhage from the mouth, raising of considerable phlegm for two weeks, and a sense of fatigue which has persisted for about two weeks. She was well and active for several years; in fact, until the middle of November 1930, when she began to experience fatigue. At this time she developed cough and expectoration. She continued her usual household activities, however, until November 29th when she coughed up about a half cupful of bright red blood. This occurred during the night. In a day or two she had two or three hemorrhages. Another occurred two weeks later. She remained in bed for five weeks. The rectal temperature ranged from 99.8 to 99.2. At no time did she experience pain or loss of weight. Careful examination of the sputum revealed no tubercle bacilli.

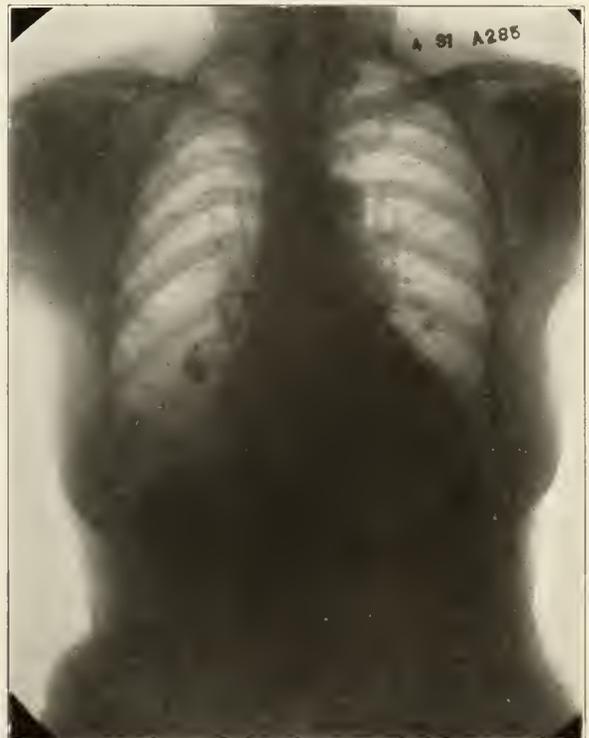
In her past history, this patient had measles, whooping cough, and diphtheria. In 1890, approximately 40 years ago, she had a frank pulmonary hemorrhage. At that time she lost about twenty-five pounds in weight. She was confined to bed for a short period of time. Five years later she again had a pulmonary hemorrhage followed by weight loss. Ten years later this patient developed pneumonia but had no hemorrhages at this time although her sputum was rusty. One year later, she had a recurrence of pneumonia. During the last twenty-five years she has had at varying intervals four or five hemorrhages from the lungs. During these twenty-five years, tubercle bacilli have never been found in the sputum. She has four children living and well. None are dead. So far as is known, there has been no tuberculosis in the family. Her mother was sick for three years, dying at the age of 93 years of senility. Her father had a lung abscess at the age of 69. She has one brother living and well at the age of 63, two sisters living and well at the ages of 71 and 77.

On X-ray examination, Figure 1, there is seen evidence of large masses of calcium deposited in the hilum region on each side. There is also seen large calcium deposits in the lung parenchyma

lateral to and below the hilum on each side. In the apex of each lung there is a shadow which probably represents calcareous deposit. Most of these shadows are quite irregular in shape. In the right sub-clavicular region, there is some evidence of a slight fibrosis. The X-ray film shows a definite enlargement of the heart shadow in the region of the left ventricle but also to the right suggesting the left ventricular type in a fairly advanced stage with probably considerable dilatation of both ventricles.

This case is of special interest because of the large calcifications present in the hilum and in the lung parenchyma, indicating the childhood type of tuberculosis in a person of 76 years of age. The cause of the hemorrhages is a subject of considerable interest. With the cardiac findings on the X-ray film, one might suspect this as a cause. With the careful examination of her chest and blood pressure over many years, it seems doubtful that the pulmonary hemorrhages have been due to the cardiac condition. It is

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*Presented before the Medical Staff of the Lymanhurst School for Tuberculous Children, March 24, 1931.

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NORTH DAKOTA SCORES IN LEGISLATION

The recently enacted law in North Dakota requiring applicants for licenses to practice chiropractic to have a preprofessional education equivalent to two years of university work and permitting chiropractic licentiates to practice physiotherapy, electrotherapy and hydrotherapy, as taught by chiropractic schools, is different from the usual enabling act in that it definitely forbids certain practices.

It specifically states that they are not to prescribe or administer any medicine or drug, included in materia medica, to be taken internally, nor to perform any surgery, nor to practice obstetrics, nor to use the title physician or surgeon.

When limitations are written into the statute itself, no judicial opinion is required to determine the boundary. Landmarks like these would appear to be immune to "interpretation" and change. A cultist should be held to the methods he advocates, and prohibited from encroaching upon the domain of others that as a matter of fact he has decried in building up his own exclusive dogma. It would not be such a bad adjustment if chiropractic adjusters everywhere could be confined to adjusting.

A. E. H.

THE NECESSITY OF THROAT CULTURES

The article in this issue entitled "Throat Cultures and School Attendance" is worthy of special comment. When one actually sees the figures contrasting the prevalence of positive throat cultures in 1913-14 with those of 1931-32, one is convinced of the efficacy of such procedure. One often hears parents complain that after a child has been ill with an upper respiratory infection, or any condition resulting in soreness of the throat, that the first day the child returns to school the nurse takes a throat culture and sends the child home, even though every symptom of disease has disappeared. The parents are instructed to send the child back to school the next day about 10 o'clock. Why the delay or the loss of more than a day's work in school? It is simply the loss of the time required to determine whether diphtheria bacilli were found in the throat culture. While the parent whose child was kept out of school for slightly more than a day might complain bitterly, the parents of all the other children in the school, and especially in that particular room or grade, would have reason to rejoice that this splendid protective measure had been taken. It is true that thousands of cultures are taken which prove negative; at the same time it is true that during the school year of 1931-32 by this simple

procedure 71 children were found to have positive cultures. These children may or may not have been in danger themselves, but most certainly many of them would have jeopardized the health of those with whom they associate. The slight annoyance that comes to a relatively small number of families in the course of a year from having their children excluded from school while waiting for culture to grow is very easily obviated. All that is necessary is to have the family physician take the throat-culture and send it to the Department of Health so that a report is available the morning the child returns to school. The report of the culture finding is then on record and if negative the child is readmitted to classes the same day his physician feels he is able to be in school. After all, it is a matter of the family physician performing his duty in each case. When the public becomes informed that the private physician's cultures are acceptable, a far larger number will call upon him. Nowhere in the practice of medicine is there a greater opportunity for our profession to arrive at its chief goal, namely, the prevention of disability and death through disease, than by the proper co-operation with health officers in controlling such communicable diseases as diphtheria.

J. A. M.

AN INTERESTING TRICENTENARY

The three hundredth anniversary of the birth of Anton van Leeuwenhoek occurred recently. Accounts differ as to the exact month and day, but the occasion might well have received more formal recognition. Leeuwenhoek seems to have been connected with a well-to-do family, a man of limited academic training, and one who in some respects perhaps lived an easy going though a long and active life. He is often spoken of as the inventor of the microscope, but simple lenses had long been used for magnifying, and crude forms of the compound microscope were in use before his time. He, however, threw himself into a life work of perfecting lenses and experimenting with their uses, and he brought the instrument to a development heretofore unsuspected as possible. It is said that he owned some 247 microscopes with 419 lenses mostly of his own grinding, and that at one time he sent twenty-six of his instruments to London as a present to the Royal Society.

Not only did he possess a remarkable skill and enthusiasm for workmanship, but he had a similar passion for observing what his instruments revealed. He is credited with being the first to

see bacteria and other forms of microscopic life: he gave the first accurate description of the red blood cell, noting that it is circular in man but oval in frogs and fishes; he saw the capillary circulation of the blood; he discovered and described the spermatozoon; he saw and reported such things as the striations in voluntary muscle, the branched muscle plates of the heart, and the structure of the teeth and the crystalline lens. Garrison says that he sent 375 reports or papers to the Royal Society and 27 to the French Academy of Sciences, the first of which organizations made him a fellow in 1680, the other a corresponding member in 1697.

With it all he seems to have been extremely modest. He was content to work for the perfection of his instruments, to look at what they revealed simply for the joy of looking, and to report accurately what he saw. He jumped to no conclusions, he formulated no hypotheses, displaying a restraint quite as interesting and as admirable as his capacity to do, to see and to show. A pioneer or an explorer in the days when by some definitions there was no science, he was in many ways an ideal scientific investigator.

H. E. F.

WHAT IS STATE MEDICINE?

Dean Scammon delivered a notable and highly informative address before the monthly meeting of the Sioux Falls District Medical Society on Tuesday, April 11, in which he summarized and elaborated his views relative to the correlation of the long existing medicine of the guild and its modern developments which he terms fiscal medicine and its latest associate, the much-discussed state medicine. He showed, first, that in common with other trades and professions, medicine as a guild was part of medieval society five centuries ago, a closed corporation in every sense of the word, and as such survived the great religious, commercial and industrial revolutions which later swept over Germany and England and caused marked changes and modification in every other field of activity. Medicine alone withstood the stress and today remains the only survivor of this ancient form of organization, wherein its members are welded together by common aims and purposes and cherish a guild tradition to ethical standards and procedure towards each other. This is what constitutes the basis of a profession and it is the foundation and superstructure of medicine today. What, then, has happened to threaten its continued existence as such? Fiscal medicine,

involving the intervention of outside interests of lay or non-medical forces, for example insurance in some form or other and finally, added to the last mentioned, is the paternal inroad of state medicine, in which it is proposed to subject medicine to the domination of public control, known as state or social medicine. There is similarity about both these types of management. Fiscal or insurance medicine may be voluntary or made compulsory by law: state medicine is compulsory at present only for the indigent but if carried farther might be made more sweeping, as in the present panel system in England and certain continental countries of Europe.

That these later developments are impractical of fulfillment to any extreme degree is demonstrated by an analysis of the economic side of the question. Figures were shown to prove that the cost of administration of plans of this kind was to be prohibitive, if carried to a complete extent. In voluntary measures the saturation point of selling to the public is soon reached and the limitations of the tax dollar, when other apportionments are considered, would prevent any great extent of the compulsory plan.

Much of the trouble now is due to oversupply in the professional ranks, with a general population rapidly reaching a stationary level. The remedy for this lies in ourselves. Another source of professional difficulty is the large amount of service rendered without remuneration. While the remedy of these two factors is only palliative it would at least bring about some relief in a situation which is causing much unrest and material distress throughout the entire medical profession.

G. C.

GROUP HOSPITALIZATION

It appears that St. Paul got group hospitalization and three per cent beer at about the same time. Whatever significance attaches to that synchronism, both had been brewing for some

time, and we avoided taking sides; but now that the plans are operative, we hope soon to have some convictions about the hospitals at least.

It appears that eight hospitals joined in a movement agreeing to give services on a non-profit making basis to men or women in groups of five or more at the rate of 75 cents a month or \$9.00 a year entitling each to twenty-one days of care annually on one or more admissions.

Social experiments are always interesting, especially when carried on outside of our own immediate bailiwick, and this one deserves open-minded attention in the wake of all this high-cost-of-care discussion.

There is some danger of a recession from the principles of ethics involving solicitation. Hospital staff members would seem sure to profit by the arrangement over non-staff members, even in so-called "open" hospitals. Is it not possible that non-affiliated members of the profession may be organized into a counter movement? Or if it proves satisfactory, is it not reasonable to assume that the medical profession will be asked to make similar arrangement for their attendance. It is safe to say that all would not join, and then we would have the confusing quotations of a French menu, with or without wine. We fear that *vin compris* will be popular because convenient and that quality may suffer.

A. E. H.

CHILDHOOD TYPE OF TUBERCULOSIS IN THE AGED (REPORT OF A CASE)

(Continued from Page 229)

more probable that the hemorrhages have been due to pneumoliths or lung stones with their sharp edges cutting the soft tissue and protruding into ramifications of the bronchi. It is a well known fact that calcium deposits are often coughed up with hemorrhage. This case is also of interest because it shows how much trouble can be caused by a childhood tuberculosis throughout a long life.



SOCIETIES

**THE SOUTH DAKOTA STATE
MEDICAL ASSOCIATION**

HURON, S. D., MAY 15-16-17, 1933

Fifty-second Session

Monday, May 15, 1933

- 2:00 P. M. First Session of the Council.
- 7:00 P. M. First Session of the House of Delegates.

Wednesday, May 17, 1933

- 7:00 A. M. Second Session of the House of Delegates.
- 12:15 P. M. Second Session of the Council.

Tuesday, May 16, 1933

- 8:30 A. M. Orthopedic Clinic. M. S. Henderson, M.D., Professor Orthopedic Surgery, Mayo Clinic, Rochester, Minn.
- 10:00 A. M. Cancer Clinic. J. C. Bloodgood, M.D., Clinical Professor of Surgery, Johns Hopkins University High School of Medicine, Baltimore, Md.

Noon

- 1:30 P. M. Presidential Address: J. R. Westaby, M.D., President, South Dakota State Association, Madison, S. D.
- 2:00 P. M. Paper: "The Treatment of Tuberculosis of Joints," M. S. Henderson, M.D.
- 2:45 P. M. Paper: J. C. Bloodgood, M.D.
- 3:30 P. M. Paper: "Progress and Present Status of Roentgenological Diagnosis," B. R. Kirklin, M.D., Mayo Clinic, Rochester, Minn.
- 4:15 P. M. Paper: "Tuberculosis of Animals and Man," T. W. Munce, D.M.V., Sioux City, Iowa.
- 5:00 P. M. Paper: "The Economic Importance of Tuberculosis Eradication," H. J. Boyts, Live Stock Commissioner, Sioux City, Iowa.
- 7:00 P. M. Annual Dinner, Marvin Plughitt Hotel. Toastmaster, W. H. Saxton, M.D., Huron. Address of Welcome: H. D. Sewell, M.D., President, Huron District Medical Society, Huron, S. D.
Response: J. R. Westaby, M.D., President, South Dakota State Medical Association, Madison, S. D.
"Your Medical School": A. G. Pohlman, M.D., Dean, Medical School, University of South Dakota, Vermillion, S. D.
Address: J. C. Bloodgood, M.D., Clinical Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Wednesday, May 17, 1933

- 9:00 A. M. Cancer Clinic. J. C. Bloodgood, M.D., Clinical Professor of Surgery, Johns Hopkins University School of Medicine.

Noon

- 1:30 P. M. Address: E. W. Jones, M.D., President-elect, South Dakota State Medical Association, Mitchell, S. D.
- 2:00 P. M. Paper: "Allergy," C. K. Maytum, M.D., Mayo Clinic, Rochester, Minn.
- 2:30 P. M. Paper: "Experimental Production of Urinary Calculi," Chas. C. Higgins, M.D., Cleveland Clinic, Cleveland, Ohio.
- 3:00 P. M. Paper: J. C. Bloodgood, M.D.
- 4:45 P. M. Report of Typhoid Epidemic at Chamberlain, S. D.: A. E. Bostrom, M.D., Epidemiologist with South Dakota State Board of Health, and W. W. Towne, Sanitary Engineer with South Dakota State Board of Health.

**WOMAN'S AUXILIARY
of the**

**SOUTH DAKOTA STATE MEDICAL
ASSOCIATION**

1910-1933

Annual Meeting, Huron, S. D., May 16 and 17, 1933

• Officers

- President—Mrs. N. K. Hopkins.....Arlington
- President-elect—Mrs. J. C. Ohlmacher.....Vermillion
- 1st Vice-President—Mrs. J. C. Shirley.....Huron
- 2nd Vice-President—Mrs. W. G. Magee....Watertown
- Secretary—Mrs. A. E. Johnson.....Watertown
- Treasurer—Mrs. G. H. Gulbrandsen.....Brookings

PROGRAM

Tuesday, May 16, 1933

- 9:30 A. M. Registration and Business Session.
- 2:00 P. M. Musical Tea at the home of Mrs. H. D. Sewell, 704 Idaho Avenue S. E., Huron.
- 7:00 P. M. Annual Association Dinner.

Wednesday, May 17, 1933

- 10:00 A. M. Business Session, Election of Officers.
- 12:30 P. M. Bridge Luncheon, Huron Country Club.

Local Committee

- Mrs. J. C. Shirley, Huron.....General Chairman
- Mrs. R. A. Buchanan, Huron.....Reception
- Mrs. O. R. Wright, Huron.....Reception
- Mrs. J. S. Tschetter, Huron.....Transportation
- Mrs. H. L. Saylor, Huron.....Musical Tea
- Mrs. W. H. Saxton, Huron.....Bridge Luncheon
- Mrs. W. L. Mattock, Huron.....Golf

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. I. M. Roadman, St. Paul, have returned home after spending the winter months in Florida.

Dr. Godfrey Deziel, 71 years of age, who has been in active practice on the east side at Minneapolis for the past 45 years, died recently at St. Andrews Hospital.

Dr. B. K. Kilbourne, city health director at Fargo, reports that the year 1932 enjoyed the best health since the department had been organized in that city.

Dr. F. H. Wiechmann has recently opened offices for general practice at Young America, Minn. The doctor received his degree from the University of Minnesota.

Dr. Charles H. Mayo of the Mayo Clinic, Rochester, recently made the statement that 46% of deaths occurring before the age of 60 are traceable to teeth and only 41% to tonsils.

Dr. John A. Cameron, a prominent St. Paul physician, passed away on April 4th, having been in active practice for over 30 years. Dr. Cameron had been suffering from heart trouble for several months.

About 40 of the Duluth physicians have moved into the new Medical Arts Building which has been recently erected for their exclusive use in that city. Many more are to follow on June 1st, when the building will be completed.

The quarterly meeting of the Stutman County Medical Society was held last month at Jamestown, N. D., Dr. W. H. Long, Fargo, being the guest speaker, presenting a paper on "The Diagnosis and Treatment of Chronic Anemias."

Dr. Joseph Colt Bloodgood, of Johns Hopkins University, internationally known authority on cancer, will be one of the principal speakers at the annual convention of the South Dakota State Medical Association in Huron, May 15-17.

The Montana State Medical Society will hold their annual meeting at Anaconda on July 12th-13th. Dr. Rudolph Sievers, Butte, is president of the association, and the program will be published in a later issue of THE JOURNAL-LANCET.

The Board of Education of Minneapolis has made a rule that all teachers will be required to submit to the Mantoux tuberculin test before the opening of school in September, 1933, under arrangements to be made by the Director of Hygiene.

The annual meeting of the South Dakota Association of Nurses will be held at Aberdeen, April 18-20. Miss Mabel O. Woods is president, and Miss Vera Halvor is secretary. A very interesting program has been arranged for the three days' sessions.

Druggists, lawyers and dentists were guests of the Lyon-Lincoln Medical Society at their monthly meeting held at Tracy, Minn., on March 14th. Mr. A. R. English was the principal speaker, his topic being "The Relationship between the Court and the Doctor."

Ten students in the school of medicine at the University of North Dakota have been accepted to continue their advanced training at medical schools outside the state, according to reports received from Dr. H. E. French, dean of the University Medical college.

North Dakota health officers will hold their annual meeting at Bismarck on May 2nd and 3rd. A fine program is being arranged which should bring out a large attendance. Dr. H. L. Halverson, Minot, is president, and Dr. A. A. Whittmore, Bismarck, is secretary.

Dr. and Mrs. Victor Rosseau, Maple Lake, Minn., were hosts to the members of the Wright County Medical Society at their last monthly meeting. After dinner was served, Dr. Erwin W. Exley, Minneapolis, being the guest speaker, his topic being "Kidney Infections."

Doctors and dentists of Scott, Carver and Le Sueur counties gathered at a joint session of their respective organizations at Mudbaden, Minn. last month. The meeting opened with a 6 o'clock dinner. Addresses by two prominent twin-city physicians followed the dinner.

Dr. and Mrs. L. L. Sogge, Windom, Minn., were host to about 40 physicians at their home recently with a beautiful dinner, after which they were addressed by Dean Scammon, Minneapolis, his subject being "Medical Economies or the Financial Side of the Medical Question."

A new trial has been granted the More Hospital, Eveleth, Minn., and its associate physicians in the suit brought against the defendants and a verdict for \$5,400 was awarded. The suit was brought about after the doctors thought best not to perform an operation for acute appendicitis.

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). The program for April 19th is "Family Jaundice," and for April 25th, "Cancer of the Rectum."

The Minnesota State Hospital, located at St. Peter, with a capacity of 2,037 beds, is the largest hospital northwest of Chicago to the Pacific coast in a territory embracing nine states. This will be surprising news to many local physicians to whom the hospital appears as an item of ordinary importance.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on April 12th, with the following program being presented: "Adequate Treatment of Syphilis," Dr. S. E. Sweitzer; "Extra-curricular Fusion of the Hip," Dr. C. C. Chatterton; "Iodine," Dr. H. A. H. Bouman.

A golf tournament, fraternity luncheons, and other social events have been arranged to complete the social program of the meeting, some of which will include doctors' wives, and members of the Women's Auxiliary to the state body who will hold their annual meeting at Rochester during the three days of the Minnesota State Medical meeting.

Dr. Christopher Porter Gibson, said to be one of the oldest legionnaires in Minnesota, died recently at the Masonic Home hospital at Bloomington. He was a member of the American Legion post at Redwood Falls, Minn. Dr. Gibson was born at Ayer, Canada, in 1848. He was a graduate of the Chicago Medical college and practiced in Minnesota for over 50 years.

The annual meeting of the Richland County Medical Society was recently held at Wahpeton, N. D. Dr. Benjamin Thane, Wahpeton, was elected president and Dr. N. H. Greenman, Fairmount, secretary and treasurer. Drs. Hoskins, Wahpeton, and Holliday, of Lidgerwood, were admitted to membership. Dr. T. L. Birnberg, St. Paul, gave a paper on "Skin Conditions of Babies."

Dr. W. A. Fansler, former national head of Phi Beta Pi, medical fraternity, addressed more than 100 physicians from six midwest states at the Phi Beta Pi 29th annual Founders' Day banquet held at Minneapolis as the closing feature of the three-day biennial convention of the cen-

tral province organization of the fraternity. Physicians from Minnesota, Iowa, Nebraska, Missouri, Colorado and Kansas attended the convention.

An unusual number of cases in one or two Minnesota localities prompted the Minnesota State Medical association to issue a warning bulletin on meningitis. Saying that the situation is such as to deserve special watchfulness, the bulletin adds: "The disease afflicts more children than adults, and any illness with fever, whether or not it shows the typical symptoms such as rigidity of the neck, should be reported to the doctor immediately.

Dr. John E. Dewar, Minneapolis, said to be one of three medical men in this country who are members of the Royal College of Physicians and Surgeons of England, died March 15th. Dr. Dewar was born in Glengarry, Ont., Canada, and was a graduate of McGill university in Canada, later taking courses in Edinburgh and London in the British Isles, where he became a member of the Royal College organization. He came to Minneapolis in 1896.

The Hennepin County District Court sentenced Mitchell Jurdy, 28 years of age, to serve six months in the Minneapolis Workhouse. The Court refused to suspend the sentence because of the fact that Jurdy has a previous conviction for a similar offense committed in Minneapolis in 1932. Jurdy was tried before a jury which deliberated only 45 minutes in bringing in its verdict of guilty. The complaint against Jurdy charged him with prescribing and suggesting a form of treatment for Mrs. Katherine Auge, Minneapolis. Mrs. Auge paid Jurdy a total sum of \$158.00. Mrs. Auge has been suffering for some time from Hodgkins disease. On February 19, 1932, Jurdy pleaded guilty to a similar offense and received a suspended sentence of one year in the Minneapolis Workhouse. While he was on probation the present case occurred. Jurdy has professed to be a naturopathic physician and physical culturist. The investigation of this case was handled by the Minnesota State Board of Medical Examiners in co-operation with the Better Business Bureau of Minneapolis. Judge Levi M. Hall, before whom the trial was had, presided over the same in a very fair manner. The defendant was accorded his rights and at the same time a fair instruction was given to the jury by Judge Hall in reference to the law on this subject.

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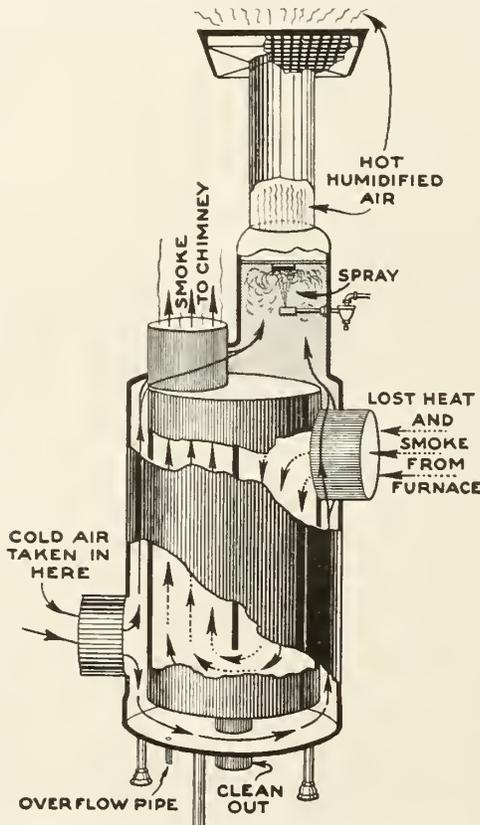
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May 1, 1933

New Series
Vol. LIII, No. 9

The Dawn of a Specialty in Medicine Allergy and Physical Allergy*

W. W. Duke, M.D.
Kansas City, Mo.

I WISH to express my sincere appreciation to this association for an invitation to read a paper on my favorite subject in internal medicine, this is "Allergy."

We are passing a new era in the practice of medicine in the development of this subject. We are making a wide departure from trodden paths. Possibly as wide a departure as that which followed the advent of the early studies in bacteriology. In text books of the present day on general and special pathology, and in the text books devoted to general medicine and the treatment of disease of special organs, we find classifications of disease which consists essentially of malformations, traumata, acute and chronic inflammations, intoxications, benign and malignant tumors, etc. We now have to add to the above, an additional item, namely, the allergic diseases which affect the individual as a whole, and also which can affect directly or indirectly, each of the special organs. It is a question with me whether or not any active living tissue is immune to the effect of allergy.

Allergy differs from the above mentioned illnesses in that it is caused in general by agents which are more or less inert, or actually beneficial or necessary to normal individuals, such agents for example, as food, pollen, hair, or insect scales, or by physical agents so essential to health as light, heat and cold.

There are apparently two phases of allergy.

*Read before the South Dakota State Medical Association at Watertown, June, 1932.

The one, a local effect which occurs as a result of direct contact between a sensitive tissue and an offending agent; the other an effect which resembles that which occurs as a result of overstimulation of one or several or possibly all the branches of the vagas nerve mechanism. These effects are of course multitudinous, since the vagas nerve influences the activity of every living tissue.

The local lesion of allergy differs radically from other lesions in many respects. It consists characteristically of pale swelling which is oedematous and anemic, and is surrounded frequently by an area of hyper aemia. It can appear with great rapidity and disappear with equal rapidity. Following rapid disappearance there is almost always complete restitution of the parts affected. This is, of course, subject to gross exception. For example, the allergy lesion can be so intense (exemplified by the Arthus phenominon) as to cause gangrene of the parts affected. Furthermore, if an allergy lesion affects a part perennially without remission, it can cause hyperplasia of the tissue elements. For example, perennial allergy in the nose gives rise to so-called hyperplastic rhinitis and polyps. In the skin to gross hyperplasia of the skin elements which causes it, in many cases to take on leather-like thickening of the skin. In the Bronchi it can give rise to muscle hypertrophy and proliferation of the tissues. With complete subsidence of the disease these hyperlastic lesions usually disappear and leave the tissues with com-

plete or almost complete restitution to normal structure.

The above statements are all subject to gross exception, because of the fact that the damage done by allergy depends in large degree upon the situation of the lesion. A gross swelling in the loose elastic tissues in the axilla for example, does no harm. A similar lesion of allergy, however, in the internal ear or inside the skull can seriously damage the affected structures and neighboring structures. Oedema in soft elastic parts is not especially dense. In more resistant structures, however, the swelling may be so dense as to give the impression of cartilage.

The allergy lesion can be very gross indeed; in fact, so gross that in cases where the face is involved, the features may be almost obliterated. It can cause obstruction in the trachea, obstruction of the intestine, and in the urinary tract, can cause such a disturbance that the resulting symptoms may simulate and exceed those caused by stone.

There is a gross pharmacological difference between allergy and the lesions it may simulate. The one can be stopped immediately as a rule, by the adequate and ideal use of adrenalin, and may be little affected by morphine. In the case of organic disease, the reverse status usually obtains.

The allergy lesion also differs cytologically from other diseases, in fact, it is characterized by the presence of a typical cell, namely, the "eosinophil." Eosinophils present an almost constant finding in allergic tissues at certain phases of the reaction. They are likely to occur in great numbers. They are to be found not only in the affected tissue but also in the blood during certain times and may amount to as much as or more than 25% of the white cells. High Counts such as these, however, are the exception, not the rule. Eosinophils are increased as a rule not only in the blood but also in the secretions, such as the salivary secretion, nasal secretion and bronchial secretions—and even in the mucous secretion found in the stools in the case of allergic diarrhoea. The finding of eosinophils is important from a diagnostic standpoint.

For example, in the case of acute coryza, the finding of a gross preponderance of eosinophils in the secretions indicates that the coryza is primarily allergic. If a gross preponderance of neutrophils is found, the disease is infectious in origin. If there is a goodly number of both eosinophils and neutrophils, the lesion is probably infection superimposed upon a primarily allergic disease.

Whereas, the local lesion briefly described as above is grossly important, it is hardly so wide-

spread or damaging as the widespread effect of over-activity of one or several or all of the branches of the vagus nerve. This effect may be more rapidly fatal in extreme cases than any illness with which I am acquainted. In extreme instances, it may resemble the rapidly fatal histamine poisoning, as observed experimentally in animals. General vaso and capillary dilation may be so extreme that the afflicted individual bleeds to death very quickly in his own vessels. In this case, none of the classical signs of allergy appear. Instead, the patient suddenly becomes apparently lifeless. Pulse and respiration stop, and the patient assumes the appearance of a cadaver. I have had the opportunity upon three occasions of restoring a patient from this condition promptly to a state of health by the quick and adequate use of adrenalin. I have also had patients subject to allergy die suddenly without apparent cause, rhyme or reason, after the eating of a hearty meal. I frankly believe that allergy ranks as one of the most common causes of sudden death of apparently healthy individuals. Death is caused as a rule, I believe, by the encountering of an agent which far exceeds the individual's tolerance.

Allergy may simulate a great many non-allergic diseases, but almost never simulates them perfectly, and can almost always be differentiated from non-allergic disease by careful physicians who understand this subject.

For example: Cerebral allergy can simulate brain hemorrhage, meniers disease of organic origin, migraine, epilepsy or even brain tumor. The distinguishing features lie in family and personal history of allergic disease, the co-existence of other symptoms typical of allergy. The fact that allergic symptoms are inclined to come and go or migrate, and by the fact that they yield promptly if uncomplicated to the effect of adrenalin when ideally administered. Frequently recurring cerebral disease (diagnosed as a rule as vessel spasm); frequently recurring functional disease of the heart, including tachycardia (not paroxysmal), angina pectoris, and various and sundry arrhythmias, are rather frequently caused by allergic disease (probably vagal) and can be relieved immediately when this is the case, with adrenalin if ideally given.

There are many types of allergy. There are types which are so widely divergent as to cause pathology and pathogenesis, that we are indeed fortunate in having the non-committal term "allergy" under which we can class this group of diseases. The different types of allergic diseases may have nothing more in common than is indi-

cated by the literal meaning of the word "allergy," namely, "altered reactivity." Some of the different types of allergy may be grouped as follows:

1. *Serum Sickness*—Which can afflict almost any normal individual, if the dose of serum administered is large enough. This occurs typically several days or two weeks or more after administration of a foreign serum. It may be gruesome in symptomology but rarely is a dangerous illness if controlled by frequently repeated adequate doses of adrenalin.

2. *Accelerated Serum Reactions*—These are likely to occur in members of the atopic family who may or may not have had previous doses of the serum. This illness is likewise gruesome, but is almost always controllable by the use of adrenalin.

3. *Serum Allergy*—This occurs in members of the allergy family who have spontaneously become sensitive to serum. This illness gives rise to violent uncontrollable disease which proves quickly fatal. Coca has frequently mentioned the fact that if a person has tolerated one dose of serum he is almost sure to tolerate a second. Patients with atopic serum sensitiveness practically never tolerate a first dose, even though the initial dose may be excessively small. Lamson reviewed the histories of about 80 cases of reported serum deaths and in approximately half, a history of hay fever or asthma was mentioned. Deaths have been reported immediately following the intravenous injection of one drop of horse serum; several following the use of one c.c. subcutaneously. I know of one case in which death immediately followed the injection of 1/1000 c.c. of horse serum intracutaneously as a test. Some of these deaths might have been prevented in the present day by the use of a tourniquet above the site of inoculation of the serum, if the serum were injected into an extremity. This method of therapy, given as first by Cooke and several years later, but independently, by Insley, indicate that the arm or leg should be used for the inoculation of sera instead of the generally recommended site— buttocks, back or abdomen. In these latter areas the life saving protecting tourniquet cannot be used.

4. *Natural Hereditary Allergy or Atopy*, as it has been termed by Cooke and Coca, represent an illness which is quite different from serum sickness or accelerated reactions and which is apparently the same disease as serum allergy above mentioned. It depends upon a peculiar hereditary constitution through which a person may become sensitive to one or several or many foreign agents (Cooke and Vanderveere). The

illness frequently becomes manifest in infancy, in the form of eczema, gastro-intestinal disease, or in many other ways. In infancy the illness is usually caused by sensitivity to food, and frequently disappears after a few years. The typical manifestations, however, often reappear again in late childhood, or in youth in the form of excessive sensitiveness to some foreign agent, such as pollen, animal dander, fungi, insect scales, food or sera. Sensitiveness at this age is usually extreme in grade—in fact patients who are so affected may be made ill by foreign agents which are so small as to cause the agent to rank in toxicity for them far beyond that of any known poison except one such as diphtheria toxine, and tetanus toxine. In this condition, the patient can be affected seriously by one one-millionth m.g. or much less of the offending substance. This type of illness differs from others to be mentioned subsequently by the fact that it can be passively transferred to other individuals by the injection of the patient's serum into the skin of a normal person by the Preuxnitz and Kustner method. To illustrate:

If 1/10 of a c.c. of serum from an egg sensitive case is injected intracutaneously into a normal skin, the skin area will react with the formation of a huge hive in case the injected individual eats egg (Walzer). This disease differs grossly from anaphalactic sensitiveness as observed in animals in the fact that the patient cannot be desensitized quickly by a sub-lethal dose of the offending agent (Besredkas Method). This method of desensitization has been tried a number of times in the treatment of human allergy and always with a disastrous result. The sensitiveness of a patient of this type, however, can be reduced slowly and effectively by repeated and frequently increasing almost infinitesimal amounts of the agent to which the patient reacts. In this way clinical relief can be obtained, and upon this phenomenon is based our present day methods of so-called "desensitization."

5. The drug allergies are grossly like atopy as above described and may be equally and as tragically extreme, but differ in the fact that sensitiveness to drugs cannot be transferred passively to the skin of normal individuals by the Preuxnitz and Kustner method, nor does desensitization therapy seem practical in this condition.

There are two or more types of drug allergy, one as exemplified by a case of sensitiveness to chlorine, and a case of sensitiveness to ether as described by the writer, in which the area of the reaction is confined directly to the point of contact between a tissue and the offending agent.

For example: In a case of chlorine sensitiveness the inhalation of chlorine gas causes coryza, cough and asthma and the application of a dilute solution of chlorine to the skin causes a hive directly confined to the point of application. This condition is not transferable passively. The common type of drug allergy, however, is not like the above and is exemplified by the commonly observed aspirin allergy. In this case, symptoms such as hay fever, asthma, hives or collapse may follow the digestion of a small amount of aspirin. The symptoms appear ordinarily a few minutes or several hours after the taking of aspirin. There may be little or no reaction at the point of contact of the mouth tissues with aspirin and skin tests are practically always negative. Apparently ten per cent of hay fever and asthma patients are sensitive to aspirin (Storm Van Lewen). I have devised a simple test for aspirin sensitiveness which should always be used before administering aspirin to an allergic patient. It consists of the placing of several tiny granules of aspirin on the tongue of the patient. If he is aspirin sensitive, he usually displays symptoms of allergy within thirty seconds to two minutes. This reaction can be stopped within thirty seconds to one minute by having the patient repeatedly rinse his mouth with a glass of water containing a little dilute acetic acid. The acetic acid prevents the transformation of the insoluble aspirin into the soluble sodium salicylate by the alkaline mouth juices.

In the early days of the study of allergy it was believed that human allergy like animal anaphylaxis could be induced only by protein substances. This, of course, has been disproven, for humans can become sensitive to such agents as quinine, atropine, morphine and a host of other non-protein substances and even to inorganic substances. Wolf Esner attempted to account for this type of sensitivity by assuming that a non-protein body could combine with normal body proteins so as to produce a new body which could sensitize an individual and thereafter cause a reaction upon adequate contact. This very attractive theory is very difficult to prove in clinical cases, although it can be easily proven in animals by sensitizing to such agents as iodized protein, or protein treated with bromine. In this case the animals may not react to the natural proteins used but may react with symptoms of anaphylaxis if treated with protein altered by bromine or iodine respectively. This possible explanation should be kept in mind by students of allergy. The future may disclose a method of proving or disproving the idea.

6. *Physical Allergy*—In 1923 I made a wide departure from the study of allergy in the discovery that patients could become sensitive not only to material substances, but to physical agents, such as certain rays of light, specific for the individual or to certain degrees of heat or cold and even to the heat generated by mental or physical effort. The fact is that patients could not only become sensitive to physical agents such as those mentioned, but could become so extremely and violently sensitive that a calory of heat applied to the skin could cause extreme grades of shock in certain individuals excessively sensitive to heat. Likewise, a sip of cold water could cause a violent reaction and shock in patients sensitive to cold. In patients excessively sensitive to light the exposure of a considerable area of skin to sunlight for a few moments could cause hives and shock within a few moments, which rendered them completely helpless. In this class of patients, that is those sensitive to physical agents, I have observed every phenomenon of allergy that I have observed in patients sensitive to egg, pollen, dander and other material substances. The fact that the condition exists cannot be doubted and has been verified abundantly in recent literature. Furthermore I have found that such conditions as hives or asthma caused by emotional disturbances and varying types of mental or physical activity are usually in patients who are heat sensitive and react to the heat generated by effort. For example, many women supposedly sensitive to spermatazoa are not actually sensitive to spermatazoa but instead are sensitive to the effect of heat and effort.

The mechanism through which patients react to physical agents is rather mysterious and is probably varied. However, the fact stands proven and verified that reactions in cases sensitive to physical agents is just as specific and real as reactions caused in other sensitive persons by certain types of pollen or epithelium or by certain foods. Light sensitive cases are not sensitive to all rays of light, but only to certain specific rays toward or beyond the violet end of the spectrum. This varies in different individuals. Likewise patients sensitive to cold may not react at all to a skin temperature of 0° C. or at 20° C., but may react violently to temperatures between 5° C. and 15° C. Likewise, in patients sensitive to heat, the action may occur very violently with rises in skin temperature from subnormal or high temperatures down toward subnormal. Slight grades of heat which are generated by walking across the room or even by rising from a sitting to a standing posture, cause in some patients violent

reactions which can be immediately stopped by a little cold applied to a small skin area. Patients of this sort are almost always violently affected by the ingestion of hot drinks or hot foods, or in cold sensitive cases by cold drinks or cold foods.

Heat sensitive cases may be relieved by cold and quiet. They rarely know that they are sensitive to heat, but instinctively lead a quiet life, and avoid situations in which they are likely to be over-heated. They often give an impression of laziness. Cold sensitive persons on the other hand may be relieved quickly either by heat or effort. They rarely know of their sensitivity to cold, but instinctively lead a life of excessive activity, are inclined to exercise and develop their muscles and feel relieved after prolonged hot baths. A number of historical characters whose activities typify excessive energy could have been diagnosed as cold sensitive individuals.

In a paper of this scope I cannot deal with the details of these conditions, nor give the proofs upon which my ideas on the subject are based. For this the reader is referred to previous writings.

There are two types of physical allergy. One in which the reaction is confined to the point of contact between a surface such as the skin or the surface membranes of the nose, bronchial tubes or alimentary tract. The other type, or so-called reflex-like type, shows reaction not only at the point of contact, but in distant structures as well, and frequently in distant structures only. For example: In a heat sensitive case of the latter type the placing of one forearm in a water bath of 42 degrees centigrade, may cause asthma in one patient, nasal stoppage in another, hives in another or even profound shock, prostration, disappearance of pulse and respiration in another and finally even convulsions, headache, temporary blindness, vomiting or any number of symptoms which I could mention. The symptoms resemble exactly those caused by contact with egg in an egg sensitive case. It is interesting to remark that in extreme cases such as the above-mentioned reaction can be almost immediately relieved by rubbing a relatively small area of skin with a piece of ice. Often the cooling of a hand, arm or both arms will relieve. One can well wonder why patients of this type are not in a constant state of reaction. The fact is that in patients of this sort, reaction is prevented by subconscious avoidance of heat and effort or cold which is beyond their tolerance. A change in the habits or situation of patients of this sort may result disastrously; in fact, is likely to result in invalidism, or in heat

cases in what is commonly diagnosed, heat prostration or sunstroke.

The causative agent in the two types of physical allergy mentioned are different. In the contact type, the patient belongs to the allergy family, in the same sense that patients with drug or pollen allergy belong to the allergy family. In the reflex-like type, however, the situation is different. The etiology in this type of illness is varied. It occurs very frequently in the allergy family, but occurs very often in non-allergic families, due to the effect, I believe, of some disease which throws the heat regulating mechanism out of kilter. The heat regulating mechanism is very complex and requires for its normal activity the co-ordinated action of a great number of structures. Structures of such vital importance as the sense organs in the skin, respiratory tract and internal organs of the perception of heat and cold; also a thermostat-like mechanism in the midbrain which responds to the sense of heat or cold or to a change in blood temperature, and in their normal response cause heat to be retained or expelled as indicated from the respiratory tract or skin. Normal regulation of heat loss requires, of course, the co-ordinated responses of the vaso motor center, respiratory center and the entire cardio vascular system lung and skin and finally voluntary actions of the patient are called into play when he feels too hot or cold.

Sensitiveness to heat and cold is not frequently found in children and when found usually follows a febrile disease, usually measles or scarlet fever or cholera. Reflex-like reactions become more common with age as one or another element which plays a part in the regulation of body heat, breaks down and becomes ineffective. Very frequently, however, we find individuals sensitive to heat, effort or cold, in whom the most exhaustive physical examination discloses no cause for the condition except the fact that the illness is anti-dated by a febrile disease or other illness.

In writing my monograph on Allergy, I introduced the term "Physical Allergy" as a non-committal word, under which the above diseases could be grouped. The term "Allergy" is non-committal, meaning nothing more than altered reactivity. The term "Physical Allergy" meaning altered reactivity to the effect of physical agents indicates only what the literal translation of the term indicates. I do not assume that either type of physical allergy is or is not related to allergy, caused by egg, dander and other material agents.

Physical Allergy is very common and complicates many other illnesses, and is commonly found in patients who have allergy due to material

agents. It rather frequently follows anaesthesia, and over-indulgence in alcohol, in fact, in any condition which debilitates a patient to such a point that he does not respond normally to the effect of heat or cold. The condition is serious in every sense of the word unless correctly treated.

During reaction the patient is predisposed to infection and among cases of this sort, predisposition to coryza, bronchitis and pneumonia is great. Relief of the condition is frequently associated with increased immunity, even against such organisms as effect the skin and respiratory tract.

In my experience, physical allergy has not been transferred passively, by either transfusion or by the Preuxnitz and Kustner method. However, there are case reports by Sir Thomas Lewis, Hortan and Brown and several others of passive transference of cold sensitiveness.

7. *Contact Eczema*—There are several types of allergic eczema. The commoner type is that caused by reaction in the skin, causing dermatitis in the same sense that reaction in the bronchial apparatus causes asthma. This can be due either to sensitiveness to material substance, such as foods or to physical agents, such as heat or cold. There is, however, another type of eczema which seems to represent a different type of disease from any of those previously alluded to. This type occurs typically in the case of poison ivy dermatitis, primrose dermatitis, or ragweed oil dermatitis. It is apparently caused by the oily substance of the plant. It is typified by the fact that it can be induced artificially in normal or non-allergic people by contact with oil. It can be relieved by weekly injections of the oil in tiny doses. It cannot be passively transferred by the Preuxnitz and Kustner method. Allied with this is a type of physical allergy which causes a similar type of eczema of the exposed parts caused by physical agents such as light and which can be relieved completely by exposure of large areas of skin to light of the wave length which produces the illness. All eczemas of this type appear in the form of a delayed reaction occurring after a period of 24 hours or more, but which persist for a week or ten days after removal of the cause of the trouble. In trying to account for eczemas caused by light we might imagine that the reaction is caused by the breaking down of some of the normal skin oils by light, and that the broken down substances sensitize the patient, and cause eczema when the substance is liberated again in the skin through the action of light. I have nothing to offer in proof of this attractive theory except what might exist in the fact that it can be relieved by exposure of areas of skin to light other than areas subject to

the reaction. This much resembles an immologic case. This type of dermatitis is rather common and may be extremely disagreeable. Relief results in complete restitution of the affected parts if the cause of the illness is removed.

CAUSES OF REACTION

Among the commoner causes of allergy regardless of type, may be mentioned briefly, light, dry pollen, foods, epidermal substances, spores and fungi, including skin fungi, many constituents of dust, intestinal parasites, insect scales, insect bites, drugs, many constituents of smoke, bacteria, foreign sera, substances transmitted by blood transfusion. Also apparently substances of indigenous origin, such as patient's own breast milk, also specific physical agents, such as light, heat, cold and mechanical irritants. In addition to the above, there is a type of physical allergy which is postural and which will be described at a later date.

SYMPTOMS

Symptoms are so well known that they need not be repeated here in detail. They may be classified briefly as generalized allergic shock, orbital symptoms, nasal oral symptoms and pharyngeal symptoms, laryngeal symptoms, bronchial symptoms, gastro-intestinal symptoms, cutaneous symptoms, urological symptoms, pelvic symptoms, neurological symptoms and miscellaneous symptoms such as hives angioneurotic oedema, hypertension and certain cardiac and cardiovascular symptoms. Finally there are certain miscellaneous symptoms depending upon the site of reaction, which gives rise to symptoms such as headache, prostration, tremore, convulsions, delirium, bewilderment, phobias, coma, paralysis or aches and Meniers syndrome. Many symptoms could be added to the above which have definitely been proven due to the direct or remote effect of allergy, and probably many additional phenomenon will appear as proven effects of allergy when studies of the subject progress.

For a more complete review of the causes and symptomology of allergy and of the means by which they can be proven allergic, the reader is referred to the vast literature which has been written on this subject.

SPECIFIC DIAGNOSIS

There are two phases in the diagnosis of allergy, first, proof as to whether or not a given symptom is allergic in origin and second, which is much more difficult, discovery of the specific cause of the illness. As aids in the diagnosis of the first phase, may be mentioned a positive family and personal history of typically allergic symp-

toms dating from an early age. Recognition of one or more typical manifestations allergic in the patient such as nasal or bronchial allergy or hives, one or several reactions at site of skin tests and the therapeutic effect of adrenalin. Finally the effect of avoidance of contact with suspected agents.

The discovery of the direct causes of a given reaction is very much more difficult than proving the condition is primarily allergic in origin. This is especially difficult because the gross majority of patients, except infants, are sensitive to more than one agent, in fact, rather frequently to several or many agents. The situation is furthermore, difficult because in the case of multiple sensitiveness one agent may cause reaction in one tissue while other agents may cause reaction of a different type located in other areas (Vaughan). This diagnosis may tax the ingenuity of a physician to an extreme.

The remoteness of the source of the evil can be illustrated by mentioning a patient sensitive to soy bean. He was not only made ill by inhaling soy bean dust in a mill and at home when the wind blew from the direction of the mill but also by the ingestion of milk or butter from cattle fed with soy bean fodder. He was also made ill by contact through artificial foods and oils containing soy bean products. This patient rightfully asked, why leave the mill when soy bean seems to be everywhere?

Cotton seed and linseed products, corn products and even castor bean products and fish glue are difficult of avoidance in highly sensitive patients. They have a distribution which makes complete avoidance difficult. Upon finding a primary offender in a given patient the reader may be surprised at what a good encyclopedia will disclose concerning its distribution and sphere of use.

Skin tests, while not infallible, are very useful in the diagnosis of allergy. They give useful information, especially in pollen cases, epidermal cases, dust and fungus cases, and in patients sensitive to insect scales. They are useful but less dependable in smoke cases, food and drug cases, bacterial cases, and in patients sensitive to sera.

Scratch tests used with glycerinated extracts offer the most practical means of testing which we have at the present time. Intracutaneous tests should not be used by general practitioners on account of the possibility of terrific reactions. The method of testing can be made harmless, however, by experts. An extremity should always be chosen for intracutaneous tests so that in the case of a violent reaction, the life saving tourniquet can be used. Many cases, especially those classi-

fied as contact dermatitis, do not respond to scratch or intracutaneous tests, but they give very strongly positive reactions to the so-called patch test, that is a test made by applying the offending substance directly to the skin with the aid of adhesive. This should remain in situ for one or several days. Eczema under the material (excluding areas under the adhesive) indicates a positive reaction.

Elimination tests which eliminate specific foods with disappearance of symptoms, is one of the most positive proofs of cause which we have at our disposal in food cases (Rowe), but should be verified by the finding of recurrence of the illness upon bringing the patient again in contact with the suspected substance.

TREATMENT

The effective treatment of a severe case of allergy requires more skill, knowledge and experience on the part of the physician than for any illness with which I am acquainted in the field of medicine, in fact, upon this depends the effectiveness of the result. I know of no condition in which bungling, or playing with a condition with which a physician is not acquainted, can do so much harm. If a physician has a broad common sense knowledge of medicine and training and experience in this line of work, a result can be obtained on an average which equals or excels those which surgeons obtain in surgical cases, or dermatologists obtain in dermatological cases, in fact, the results obtained in a minority of cases seem almost magic. The correct treatment of a patient in allergic shock, for example, appears almost like raising the dead. Furthermore, the correct treatment of a child with allergic eczema, who may be asthmatic, stunted in mind and growth, and who may show deformities of the chest and face can be restored to normal in a year or two with such perfect success as to make the treatment of cretinism with thyroid extract seem a very imperfect therapeutic measure. I think the specific treatment of complicated allergy cases ought to be left to a specialist in the line just as operative surgery, operative otolaryngology, or orthopedic work ought to be delegated to specialists. The reader is referred to a portion of the Hippocratic Oath as follows: "With purity and holiness I will pass my life and practice my art. I will not cut persons laboring under the stone; but will have this to be done by men who are practitioners of this work." This might be applied to the specific treatment of allergy. It would save many sad experiences for the patient which does neither him nor

the physician much good, in fact, it seems to me to be a professional mistake for a physician in one line of work to jeopardize his reputation by the mismanagement of an allergy case. The effect of this is unfortunately very obvious to the patient.

Unfortunately patients with allergy vary in their susceptibilities to such a degree that no fixed rule can be laid down which will apply to any gross number of cases. A majority of patients seem an exception to the rule, so that the skill of a physician experienced in the line seems to be needed in the average case.

Whereas, the specific treatment of allergy ought to be delegated to specialists, the common sense diagnosis of allergy and the use of the life saving symptomatic methods of treatment ought to be known to everyone. Allergic emergencies occur frequently in the work of general practitioners, and they should be equipped to recognize and meet the situation quickly and effectively. This may amount often, not only to a most spectacular symptomatic relief but is frequently a life saving measure.

The effective and safe treatment of allergy depends upon the cause of reaction and degree of sensitiveness of the patient. We have at our disposal the choice of the following methods. Avoidance or removal of the specific causes of illness, avoidance or removal of contributory causes, specific treatment with the agents to which the patient is sensitive, non-specific treatment, and finally symptomatic treatment.

Removal of Cause of Illness—The matter of removal of cause is not so simple as one would believe. If a physician has made up his mind that a patient is sensitive to a given substance it would be well for him to examine an encyclopedia thoroughly and find out the uses and what are made of the suspected substance and its apparent distribution. This topic has been referred to previously.

Non-specific treatment is possibly indicated in certain patients. The mechanism through which it operates is speculative. I frankly believe a likely guess concerning its modus operandi would be an assumption that the benefit derived occurs partly at least as a result of the fever produced by it or by the slight raising of temperature from subnormal toward normal. Fever, regardless of cause, is likely to relieve allergy for a time. Likewise the straightening out of an irregular subnormal temperature frequently gives relief.

Specific Treatment—It hardly comes within the scope of this paper to discuss specific treatment with agents proven to be the direct cause

of the illness. Suffice it to say that the methods which appear most promising at the present time are the co-seasonal treatment as described by Vaughan and the perennial treatment as described by Stuart and by Black, modified as suggested by the writer with an addition of ephedrine and adrenalin to the treatment extract and its subcutaneous injection distal to a tourniquet. The latter procedure described briefly by the writer makes specific therapy practically safe in the hands of physicians who understand this subject, since the tourniquet, adrenalin and ephedrine holds the treatment solution local for a time and grossly slows down its rate of absorption. For details concerning the above procedures the reader must be referred to previous writings.

Symptomatic Remedies: Adrenalin—The use of symptomatic remedies is important. Adrenalin, if adequately administered, should give relief in uncomplicated cases. It is a good practice to give about 0.25 c.c. or less subcutaneously at five-minute intervals until tremor appears. This usually means that an adequate administration has been given and that relief should follow. After the dose which is most useful for the patient has been discovered, it can be repeated as symptoms tend to recur. It is advisable to give adrenalin in the incipency of an attack rather than wait until the height is reached. Adrenalin can be given repeatedly, if the dosage is correct, for months or years without much apparent ill effect.

If one wishes a more rapid effect from adrenalin in an extreme emergency, it is advisable to give it intravenously or give a given total amount, say 0.5 c.c. or 1 c.c. in five or six places intracutaneously. Both of these methods give a very quick result. The intravenous method is probably the more rapidly effective and the multiple injection probably the more useful except in extreme emergency. If adrenalin causes heart pound or arrhythmia, its rate of dissemination from the site of inoculation can be controlled almost immediately by the application of a rubber tourniquet above the site of inoculation. The tourniquet can be removed after a minute or so and reapplied if indicated. An adrenalin reaction can be stopped within less than one minute as a rule in this way. The unfortunate feature of intravenous injections is that a dose once injected can not be controlled, whereas, an intracutaneous or subcutaneous injection can be controlled so far as rate of absorption and delivery to the tissues is concerned through the use of a tourniquet.

In patients who seem abnormally sensitive to

adrenalin make the injection distal to a tourniquet. Remove the tourniquet after the adrenalin fixes itself in the tissues by vasoconstriction. This slows absorption and prevents sudden effects of overadrenalization such as headache, weakness, heart pound or tremor.

Pituitrin—Pituitrin has an effect that is somewhat similar to adrenalin except that relief does not appear so promptly. Relief so obtained lasts longer. It is useful alone or in combination with adrenalin. Some patients are sensitive to pituitrin.

Ephedrine—Ephedrine and allied bodies, given preferably in solution, has an effect similar to that of adrenalin except that the result does not appear so promptly but lasts longer. Very frequently constitutional symptoms are disagreeable and should be avoided if possible through reducing the dose to the smallest which will give a therapeutic result. Many patients are unable to tolerate ephedrine and many do not get a good therapeutic result from it. A solution of ephedrine 3% (two parts) and adrenalin 1/1000 (one part) is a useful solution for hypodermic treatment. If a tourniquet is used for a few minutes the rate of absorption of ephedrine can be slowed down to such an extent as to allow no constitutional effects.

Atropine—Drugs of the atropine series are time-honored remedies in the treatment of asthma. They can be given subcutaneously or by mouth. Sometimes as little as 1/200 or 1/500 grain three times a day is effective.

Iodides—The iodides are useful remedies, especially in older patients. The best dosage varies from a few drops to 25 or even 50 drops three times a day. Optimum dosage varies in different individuals.

Salicylates—Salicylates are very useful in treatment of nasal and bronchial reactions given in doses of approximately 10 grains every three or four hours. One must always inquire about sensitiveness to salicylates before advising their use or make the tests described previously.

Anesthetics—The anesthetics, especially alcohol, are inclined to relieve asthma. Alcohol is frequently very useful, especially if combined in fair dosages with acetyl salicylate. This combination is a useful substitute for morphine in many cases.

Habit-Forming Drugs—Habit-forming drugs are absolutely contra-indicated except in emergencies which justify the chance of causing addiction. This applies especially to morphine. The hardest cases of asthma to cure are those which have become addicted to morphine.

TREATMENT OF PHYSICAL ALLERGY

I have described the treatment of physical allergy at length in previous communications in the archives of *Internal Medicine* and in the *Journal of Allergy*.

Treatment consists in contact cases of sensitiveness to light, cold or scratches, of applying the agent to which the patient reacts more or less generally until tolerance is obtained. Surprising results frequently follow correct treatment and failure or damaging results may follow careless treatment.

The treatment of reflex-like cases is more of a problem but a problem which in many cases gives rise to highly satisfactory results.

The treatment of heat and effort sensitiveness in well marked cases is a problem. The treatment of cold sensitiveness is likely to be a success and often a brilliant success.

Heart and Effort Sensitiveness—Patients who are chronically highly sensitive to heat and effort have to reconcile themselves to a handicap and adjust their habits and occupation to degrees of heat and effort which they can tolerate. They have to avoid situations and climatic conditions in which they are likely to be overheated. They can frequently obtain relief by living in a cool dry climate if they, in addition avoid degrees of effort beyond their tolerance. A dry climate is often better for them than a cooler humid climate.

The immediate effect of heat and effort reactions can be very effectively relieved by cold and quiet. Frequently immersing the arms and hands in cold water is adequate. This does not always give immediate relief, however, in cases of delayed reaction.

If sensitiveness to heat and effort seems to be a symptom secondary to some other illness, the condition can often be relieved in marked degree by treatment of primary illness. However, in idiopathic cases, sensitiveness to heat and effort seems to persist in spite of health which seems perfect except in this one respect.

Agents which tend to keep temperature at a high level usually give relief. The patients react most markedly when temperature is lowest so that the avoidance of gross subnormality in temperature is important. Temperature is inclined to be lowest in the early morning hours. Frequently a hot bath or exercise designed to raise temperature at midnight will prevent early morning attacks. Agents which cause fever, as a rule, relieve the condition temporarily whether the fever is caused by tonsillitis, pneumonia, typhoid

fever, erysipelas or even as in one of my asthma cases by a lung abscess. Fever can be given artificially through the use of certain vaccines, especially B. Coli, and occasionally a heat sensitive case can be definitely relieved through the use of repeated doses of vaccines which cause slight fever. In one desperate asthma case caused by sensitiveness to heat, relief was obtained through the use of intravenous injections of colon bacilli which caused high grade rises in temperature. Asthma was relieved at the peak of the first reaction. This method of treatment is not without danger and is not highly recommended.

Hydrotherapy is very useful in the treatment of heat and effort sensitiveness. In highly sensitive cases it is very difficult to use heat without precipitating a reaction of some sort. Often a one second exposure to a hot lamp will precipitate a reaction which may result in a total loss of consciousness or a convulsion or result in twitching or violent asthma. For this reason heat and cold has to be applied in the beginning of therapy with great care. Frequently cold applied in a heat-sensitive case will cause shivering and the heat generated by shivering may cause reaction. For this reason both heat and cold have to be applied with equal caution. In the beginning of treatment it is frequently advisable to give bromides or adrenalin or both one-half hour before treatment is started. Heat may then be applied for a few seconds or more or possibly a minute or so until the patient begins to react. Reactions should be stopped immediately by applying cool cloths to the chest, arms and legs or if the patient can stand it a rapid rub with ice on the chest, arms and legs. As soon as the reaction has ceased, heat can be re-applied. Care must be taken not to chill down the skin too much with ice. If it is done the patient does not tolerate heat so well when re-applied. This alternation of heat and cold can be continued at frequent intervals for a period of one-half hour and can be repeated daily and for a longer period of time as tolerance is gained. A high degree of tolerance for heat can often be induced within a period of two weeks to two months. When tolerance for heat is gained an effort should be made to induce tolerance for physical effort. This can be done through the use of exercise pushed to the point of causing slight reaction and stopped with cold. This can be frequently alternated and may be repeated

many times daily in the beginning of treatment. A degree of tolerance can be obtained through this means which will not only develop emancipated muscles but change a bed-ridden invalid into a reasonably active individual.

Symptomatic remedies such as adrenalin, ephedrine, pituitrin, atropine, salicylates, the iodides may be useful in the treatment of this type of illness just as they are in the treatment of egg or pollen sensitiveness.

Sedatives such as bromides, alcohol and even chloral hydrate can be used to advantage in the early stages of treatment as a symptomatic remedy but should not be continued for prolonged periods of time.

Avoidance of mental depression and depressing environment is important. Depression apparently allows body temperature to sink to an unusually low level in many cases and can make the patient unusually sensitive to the effect of heat and effort.

Cold Sensitiveness—Patients who are sensitive to cold should be warned against exposure to cold which is beyond their tolerance.

Certain cases can often be relieved through seeking a warmer atmosphere. This does not reduce their tendency to react to cold, however.

Treatment with graduated, gradually increasing exposure to cold gives a brilliant result in a large proportion of cases. This can be taken in the form of cold baths or treatment with heat lamps alternated with ice rubs. A cold bath should not exceed fifteen or thirty seconds in its duration and should be followed as a rule, by the drying and brushing of the skin with a stiff brush. An ice rub is a very effective method of treatment. If ice is moved rapidly enough over the skin it does not give rise to a disagreeable sensation of cold any more than a cautery gives rise to a sensation of heat if it is moved with sufficient rapidity. The entire body can be rubbed with ice within a period of fifteen or thirty seconds in such a way that the patient need feel no sensation of discomfort from it. If this treatment is frequently repeated and gradually increased never exceeding the patient's tolerance, a high grade immunity to the effect of cold can usually be obtained.

Symptomatic remedies are useful in the treatment of this type of illness just as they are in the treatment of heat sensitiveness. The use of vaccines in this type of case is, I believe, illogical and unnecessary.

Clinic*

L. S. McGoogan, M.D.
Omaha, Neb.

DR. L. S. McGOOGAN: I am very sorry that my chief, Dr. Pollard, could not be with you this morning, for I know he would be able to do this considerably better than I can.

DR. MAGEE: This patient has been examined in my office this morning by Dr. McGoogan, so he has it clear in his mind. We cannot make any examinations here. The lady is 24 years old, and has one child, four. There is nothing in the past history that has any particular bearing. She has a small thyroid which may have some bearing. That part has not been worked out. The present history is that for the past three or four years she has been having spells of abdominal pain, diffuse at first, then localizing in the epigastrium and right lower abdomen. The attacks are not frequent, usually coming either just before or after menstrual periods, but more severe and lasting longer, from a few days to two weeks. She has had two attacks in the past month and is just recovering from one now. (This history was written in April. She has had two or three since). Some pain in the legs, also some headache. Vomits green fluid. Much gas during the attacks. No gastric distress between attacks, but she is not strong. Weight varies a great deal, 113, 118, 128. Present attack came on three days ago, characteristic pain in the abdomen, diffuse, locating in the epigastrium and around the lower right abdomen. She does not have frequent colds, nothing unusual about the digestive tract. Nausea at times; some gas; no heartburn; a good deal of bloating. Menstrual periods normal, four to six days, and they have been normal since this examination. Nothing unusual in her diet or mode of living. She is very nervous, very weak, unable to work but little.

Examination showed she was tender over the appendix and right ovary, and she has had some distress over the GB. Vaginal examination, second degree tear of the perineum, laceration of the perineum more marked upon the right side, third degree retroversion. Urine normal. Runs a rather low hemoglobin, 50, 59, 64. She has been treated simply by rest, mostly, getting her ready for operation.

*Clinic given before the Annual Meeting of the South Dakota State Medical Association, Watertown, June 22, 1932.

DR. McGOOGAN: I want to show this patient more for her general build and type, because she represents a type in physical construction that we see in gynecology quite frequently. She is tall, slender, a ptotic individual, who is more inclined to this sort of gynecological pathology than any other type with which we have to deal. She has a little swelling of her neck, but not very much, and her thyroid and gastrointestinal symptoms will have to be worked out in more detail than at present in order to rule out gall-bladder and thyroid pathology. However, I do want to talk about her pelvic pathology this morning and what it represents as a class and to this particular patient.

The patient had a vaginal examination this morning, and she had a rather marked rectocele, and a small cystocelle. The cervix was anterior under the symphysis. It had a bilateral laceration, more marked on the right than on the left, and there was also present a rather large so-called erosion of the cervix. The uterus was normal in size, with third degree retroversion and retroflexion. It was not adherent and was easily brought up into position by bimanual examination. The tubes and ovaries were apparently normal, inasmuch as nothing abnormal was felt by bimanual examination in either adnexal area. There were no masses and no tenderness. The lacerations are undoubtedly due to childbirth which occurred four years ago. The retroversion and retroflexion of the uterus may or may not be subsequent to the delivery with slow subinvolution of the uterus following the childbirth four years ago. Twenty per cent of women have normal retroversion and retroflexion of the uterus, so we cannot always tell in any given individual with a retroverted and retroflexed uterus whether or not the condition is pathologic if the uterus is mobile as it is in this particular individual.

With her laceration of the cervix she had a certain amount of destruction of tissue, with resultant infection in the lines of that laceration. With the constant drain of infected material from the lacerated cervix over the external os, we have a loss of tissue of the normal vaginal mucosal portion of the cervix and the formation of the so-called erosion.

As you know, an erosion of the cervix in

true pathological sense is not erosion; it is merely a replacement of the normal epithelium of the cervix in the portio vaginalis by an overgrowth of endocervical mucosa. The normal epithelium is destroyed by the infected material draining over it, and it is replaced by the more rapidly growing endocervical tissue. This tissue bleeds very freely, and this morning on examination there was a slight amount of blood on the examining finger, which brings up the possibility of whether or not with easy bleeding of the cervix we might be dealing with a malignancy. However, I do not believe that this patient has any evidence of malignancy whatsoever. In the first place, she has very little if any vaginal discharge, either in the way of a leukorrhoea or a mild intermenstrual spotting. Those are the two most prominent symptoms for the diagnosis of carcinoma of the cervix: a leukorrhoea which gradually becomes more profuse, is more watery in character and is accompanied by intermenstrual spotting, a spotting which is brought about as a rule by any trauma. Riding on a street car, jolting in riding over rough roads, and intercourse, are frequent factors in the introduction of this intermenstrual spotting.

We certainly believe today that the etiology of carcinoma of the cervix is based, in the vast majority of cases, upon previous cervical lacerations followed by infection.

Dr. Henry Schmitz, of Chicago recently reported about 11,000 cases of erosion of the cervix which had been either cauterized or amputated and in which after a careful follow up no evidence of malignancy of the cervix was found. This series of cases from the literature would certainly tend to prove that the ideal prophylactic treatment of carcinoma of the cervix is either cauterization or amputation whenever an erosion or infection is present.

My former chief, Dr. Floyd Keen, at the University of Pennsylvania, last fall made the statement to me that he had in his twenty-five years of experience in gynecology seen only one case of carcinoma of the cervix develop on a previously cauterized cervix. This was a case, however, in which the cauterization had occurred twenty years prior to the development of the carcinoma.

The treatment of this particular lesion for this patient, so far as the cervix is concerned, should consist in repair of the laceration and doing away with the erosion. The repair of the laceration can be done by a simple trachelorrhaphy following the Emmet technic, in which merely an excision is made on each side of the

cervix with removal of the infected material and the two edges brought together. Cauterization of the erosion will destroy the area and it will be replaced then by normal vaginal epithelium.

If the lesion were considerably larger, if the erosion were the size of a quarter or a half dollar, if the laceration were more extensive in character, then a different type of operative procedure might be considered, and that would be the Sturmdorf trachelorrhaphy. The Sturmdorf trachelorrhaphy, an operation that most of the general surgeons and gynecologists know, consists primarily in a cone-shaped excision of the cervix with removal of all the torn and infected material, replacing it with a flap of vaginal epithelium.

Repair of the posterior wall and the anterior wall should be done, more on the posterior wall than on the anterior wall in this particular patient, because she had only a very small cystocele. There is quite a marked laceration, however, of the perineum.

Any operation for cystocele or rectocele falls down unless the operator takes into account the fact that any hernia is the result of broken attenuated or torn fascia planes. Cystoceles and rectoceles are nothing more than hernias. In fact, the Canadian School of Gynecology calls them sacropubic hernias, which to me is a very good term and describes the condition most accurately. Some English and American anatomists, however, disagree with this particular terminology of hernia, because they claim that there is no fascia structure present.

We do know, however, from all practical points, that when a repair of a cystocele by taking into account fascia planes is done, and the same thing holds true with rectocele, we do get excellent results which are 100 per cent anatomically correct as a general rule, and which usually are about 90 to 95 per cent functionally correct.

Many of our rectoceles are associated with another hernia, and that is a hernia of the cul de sac. I have seen many cases operated upon for rectocele, and lacerated perineum, in which the operator has not taken into account the hernia of the cul de sac. His operation gives a very good perineal repair, but beyond the extent of perineal repair the examining finger meets nothing more than a very large hole. There has been no attempt whatsoever to repair any of the fascia planes rising from the posterior surface of the cervix. This frequently allows for a continued complaint of the patient of dragging down sensations of the pelvis and accounts for many of

our so-called clinical failures in the treatment of rectocele and lacerated perineums.

Personally I prefer the Curtis or Clark type of operation which take into account these hernias of the cul de sac and those formed in the posterior pelvic floor as a result of childbirth. I do not think it necessary to go into the operative technic, because it is hard to explain unless you can illustrate it by a lantern.

Undoubtedly this patient's weakness and feeling of bearing down in the pelvis are due to the lacerations of the pelvic floor and the laceration on the anterior wall, the latter forming a small cystocele.

As far as the retroversion of the uterus is concerned, possibly while Dr. Magree is getting the patient ready for operative procedure it might be wise to use the so-called therapeutic pessary. The pessary used to be a very favorite instrument in the hands of the gynecologist for the treatment of lacerations of the pelvic canal. It was simple, it did not necessitate operative procedure, and many preferred it to the operative procedure. The pessary has gradually fallen into disuse in the last fifteen or twenty years, and it has been discarded by many men as not having any place in the armamentarium of gynecologists. However, I disagree with those people. To me the pessary has several very important functions and is of considerable help in making the diagnosis of backache as to its etiological factors. We see many, many women coming into the office complaining of backache, with retroversions and retroflexions. Many of these are adherent and are the result of previous inflammatory conditions in the pelvis, either due to specific infection or subsequent to other inflammatory conditions in the pelvis, such as an acute appendix, post-partum inflammatory reactions, and other inflammatory lesions, particularly tuberculosis.

Any woman who has a retroversion and a retroflexion and also has backache, and any woman in whom the retroversion can be corrected by a bimanual examination either in the office without anesthesia or in the office with anesthesia, should have a pessary. The pessary should be correctly fitted and should hold the uterus up in good position.

Of course, a woman who has no posterior floor to hold a pessary in place is not subject to such treatment.

After the uterus has been replaced and the pessary inserted, she is watched for a period of six weeks, during which time the pessary is frequently removed, cleaned, and replaced. If

the patient's backache disappears as the result of the pessary, then you can definitely say that this patient's backache was due to her retroversion and retroflexion. If it does not disappear, then there is some other factor in the etiology of this patient's backache. Those factors are frequently sacroiliac strains, old, continued cases of myositis of the lumbosacral muscles, or some other condition in the pelvis or pelvic structures, particularly of the bony system.

If this patient wears a pessary while she is being studied for further medical diagnosis and her backache and her bearing down sensation in her pelvis and her headache (and many of these patients frequently have headache, particularly in the occipital area) disappear, then certainly they were due to a malposition of the uterus, and operative intervention should be very seriously considered. Remember, however, that this woman is twenty-four, she is still young, she is still in the child-bearing area, and no operation should be performed which might interfere with that function, providing she wishes another child.

There are a whole group of operative procedures for retroversion and retroflexion of the uterus that can be performed in women of the child-bearing age who still wish to have more children. There are probably three that are most satisfactory. One of the easiest is the operation with which many of you are familiar, the Webster-Baldy, which consists of shortening the round ligaments by passing them through the bloodless leaf in the broad ligament, and suturing them in place in the posterior wall of the uterus. The second operation is the Olshausen, which consists in suturing the round ligaments at about one-half of an inch from their insertion into the uterine cornua, to the anterior abdominal wall, hanging the uterus, as it were, from its round ligaments.

The third operation which might be used is the modified Coffey, which consists of shortening the round ligament on the anterior wall of the uterus with a reduplication of the anterior leaf of the broad ligament, and in that way you shorten the broad and the round.

These three operations do not interfere, in the vast majority of cases, with subsequent childbirth.

There have been several objections to the Olshausen operation because of the possibility of intestinal obstruction, that is the loop of bowel might very easily slip down between the round ligament and the anterior abdominal wall, either lateral to the insertion of the point of attachment to the round ligament, or between the points of

attachment. A recent report, however, from the Woman's Free Hospital in Boston, by Dr. William Graves, shows that intestinal obstruction following this operation is a very rare occurrence, and that in the women who become pregnant with this particular type of operation, there is very little difficulty during the time of pregnancy and practically none at all at labor.

Undoubtedly, if this patient is operated upon, some trouble will be found with her appendix, possibly an old condition with a few adhesions around the appendix, and that may account for some of her lower right abdominal pain.

As far as the pain down the legs is concerned, we see pain referred down the inside of the thigh in gynecological patients quite frequently, particularly in ovarian neoplasms, and in those cases in which there is a retroversion or retroflexion of the uterus, especially that due to inflammatory conditions, and in large fibroids or other tumors of the pelvis which become incarcerated in the cul de sac and press upon the great nerves as they pass down the lateral wall of the pelvic cavity.

It might be that in this particular patient a retroversion and a retroflexion with the uterus pressing on the great nerves of the pelvis or causing some interference with the blood supply in the ovary, may cause the pain down the legs. If it also disappears with the use of the pessary, certainly your etiological diagnosis is not very difficult.

One should always be careful in jumping at conclusions in gynecological cases. One should always study them very carefully. One should always rule out any extraneous condition which might be a factor in the patient's complaint. One should always be very careful in general medical cases and always do a pelvic examination on every woman, if possible, for many times we find conditions in the pelvis which are absolutely silent in character and which account for the patient's symptoms.

We do not see as many prolapses of the uterus as we used to see. I think that is primarily due to the fact that our women are receiving better obstetrical care; they are being more attentively watched through their pregnancy; they are being more carefully watched through their labor, and the extensive lacerations which destroy the fascial planes of the anterior wall of the vagina and the posterior wall of the vagina and allow prolapse of the uterus are not occurring as frequently as they used to occur. However, during the past week I have seen two women in the office, sisters, one 24 and one 26, both having

had two children, and both with an almost complete prolapse of the uterus. They had been taken care of obstetrically by very good obstetricians in a distant part of the country, and by two different men. The question arose as to the treatment of these two young women. My first question to those two women was: "Do you wish to have more babies?" They both said they did. I said, "How many?" They answered one, and I said, "All right, my advice to you is to go home and have your baby and after you have had it come back, because the amount of surgery that you will need to restore this uterus to its normal position, either by vaginal or by abdominal operation, would be so extensive that unless you are through the child-bearing era I would hesitate to do it. If it should be done and you should become pregnant again, undoubtedly the passage of the fetus through the vaginal canal would completely destroy all your lines of suture and the whole thing would be undone, you would again have prolapse and again have to go through surgical procedure to rectify it."

There is one way out of the situation if the woman should become pregnant, but that entails another operation, and that would be abdominal cesarean section with sterilization, a thing which I prefer not to do in this type of individual. I would rather have these two women go home, have their children, and six months later come in and have an extensive repair of the anterior and posterior floors of the uterus, an abdominal section, with suspension of the uterus and sterilization. They have had their three children, and that is sufficient for most individuals in this day of economic distress.

I hesitate to sterilize any individual who has had only two children, because the possibility of something happening to one of those two children is quite great, and if she is sterilized she will immediately begin to want to replace the lost child with another, and you will have an individual on your hands who comes to you and begs to have a sterilization procedure undone if it is at all possible, so she can conceive again. If they have three children and lose one and still have two, that factor is not quite so important.

The reason I mention these two sisters is the possibility of some inherited tendency in these two women to develop a prolapse of the uterus, some inherent weakness in the fascial planes that support the uterus, because complete prolapse of the uterus in a girl 24 and a girl 26 with only two pregnancies is rather uncommon. We do know that we can have complete prolapse of the uterus in a nulliparous individual. I have seen

two or three of them, one in Montreal and another in Philadelphia that I can definitely recall, women in their late forties, virgins, with a complete prolapse of the uterus. Undoubtedly here the prolapse was due to some congenital weakness in the fascial support of the uterus, increased abdominal pressure, and gradual weakening of the already congenitally weakened fascia, the abdominal pressure increasing and the uterus rapidly being pushed toward the pelvic outlet.

The operative procedure that is used for prolapse of the uterus varies with the individual's age. If she is a young woman, extensive repair of the anterior-posterior wall is excellent. This, combined with suspension and sterilization, is a very good repair. A woman who is older, perhaps in the middle forties, may have one of two procedures done. She may have a Watkins' interposition operation, remembering, however, that if you do it you should tie off the tubes at the same time, because it is rather embarrassing to have such an individual, even though she is in the late forties, return with an intrauterine pregnancy.

The third operative procedure is a vaginal hysterectomy following the Mayo technic as developed at the Mayo Clinic. These three operations take into account the patient's age and her child-bearing possibilities.

I think any operative procedure in gynecology or general surgery, if you consider gynecology a branch of general surgery, should take in the factor of the patient's age and her child-bearing possibilities. This does not merely hold true for the pelvic floor repairs. It holds true for inflammatory conditions in which you should attempt to do a conservative operation, if possible; it also holds true for fibroids. In single fibroids in young women the operation of choice is myomectomy. It holds true in women with ovarian neoplasms, benign, not malignant, however, in which you can conserve some portion of the ovarian tissue and have that woman going about with her normal function restored and maintained as nearly as possible.

This has been rather a general discussion of many problems in gynecology and has been rather informal. I had not prepared anything at all. Are there any questions?

DR. E. W. JONES: In the case of a virgin at age 30 with a complete prolapse, with considerable descent, I have diagnosed in two cases a congenital deep cul de sac, but my treatment of it has not been satisfactory. Would you explain your treatment of it?

DR. McGOOGAN: Those are some of the hard-

est problems that we have to treat. Fortunately they are very rare. Some people might see two or three in a lifetime, somebody else might never see one. I have seen five cases of a certain condition within a period of a year, and there are only 65 other cases reported in the world's literature, so what I might see and consider very common you might see and consider very rare. These prolapses of the uterus which occur in virgins are fairly uncommon. The treatment is very difficult for the simple reason that you have, as a general rule, a very small vaginal canal in which to work. The fascia is very thin, very attenuated, and any attempt to bring it together is rather unsatisfactory. However, if you can make a complete collar incision of the cervix with your anterior and posterior midline incisions* in the vaginal mucous membrane, exposing all the fascial planes, tighten the fascia anteriorly, tighten it posteriorly, following a method outlined by Dr. Walter Chipman, of Montreal—I can't give you the exact reference right now; I can get it for you if you wish—plus abdominal suspension, if she does not wish children, a ventral fixation, I think, you will find that may do it.

DR. JONES: I didn't do the vaginal work as you suggested. I tried to obliterate the deep cul de sac in both cases, and abdominal fixation in one.

DR. McGOOGAN: Abdominal fixation is not very good. However, there has been one little trick that has come out in the abdominal fixation of the uterus which I think is very well considered. I cannot tell you the man who has originated the idea, but I have seen it done recently by one other man, a general surgeon from Council Bluffs, and I think it is a nice procedure which will hold up the uterus in a case where you are afraid that your own sutures will disappear or that the formation of a heavy uterus will occur later, the uterus falling away from your anterior abdominal wall, with the formation again of a partial prolapse with adhesions. This man split from his midline incision of the fascia, two strips of fascia from the upper level of the wound to about the lower level, each strip about a quarter of an inch wide and each about five inches long. These strips were freed at the upper end but not at the lower. With a small instrument, such as a small hemostat, he transfixed the uterus on the posterior wall and pulled the left strap to the right and the right strap to the left, and then sewed them in place to the fascia outside the peritoneal cavity. That, I think, will hold the uterus when any other method of ventral fixation is very liable

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The Rural Physician and the Cost of Medical Care

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MEDICAL economics is a subject very difficult to discuss and certainly not very well understood by the average medical mind. Members of the medical profession are generally interested in the scientific aspects of their work to the neglect of careful study of its financial problems. This is particularly true of rural physicians, who are both isolated and more independent than their colleagues in the cities. Similarly, whereas urban conditions are capable of at least classification, in rural sections of each state there are numberless variations. For these two reasons, the statistics of the various lay and other reports now flooding the country are inexact and inconclusive, so that they should not be used for sweeping recommendations.

In the late political campaign we heard a great deal about the "forgotten man." It is just possible this term can soon be applied to the family physician, if some of the much talked-of plans of certain groups are carried out. It will have particular meaning for the country physicians whose work is being done in the smaller communities and who derive their incomes from the people living in the small towns and from the farmers of the adjacent territory.

Changing living conditions have been responsible for new and important developments in the practice of medicine. The establishment of clinics is a feature that might be mentioned with commendation in passing. The latest project to catch the public fancy is the socialization of all medical practice. This impresses the writer as a misstep. There are, without question, places where some one or other of the many plans under discussion would be successful, but for the bulk of medical practice, the family physician still merits consideration. It is very doubtful if any agency or plan could or would furnish the type of service he renders.

Medicine has a larger purpose than the relationship of the doctor to just his patients, and this has existed since the beginning of Medicine. Medicine as practiced in the past has been a profession, not a business. A doc-

tor is not selling merchandise, postage stamps, or bonds. He is dealing with humanity, and perhaps 99% of his patients, provided he has been established in a community for a few years, are not only patients but friends. The longer the physician lives in a community, the stronger this relationship becomes, provided he has continued with the ideals with which he began. He is not only the family medical advisor, but the confidential friend. There have always been pain and suffering in the world, and always will be. The people have always looked to the physician in the past, and still need the peculiar admixture of science and sympathy that the family doctor always has ready. Depressions come and depressions go, socialized, state and insurance projects rise and wane, but the faithful medical man goes right on doing his daily job. In bad times more is expected of him, so more he does.

He is present in a family when the first born arrives, and still on hand for the last one of the series; he advises from the colic stage to full growth, and often continues through a second generation the same way. It may safely be said that the personal contact is often as important to the patient as the medicines prescribed.

If there is any reason for a change in the scheme relating to the practice of medicine in rural communities, the following questions pertaining to such communities must be answered:

(a) Is the public in the rural communities adequately served? If it is adequately served, why should there be change? If it is not adequately served, what will be the best form of improvement? There is no reason why the rural public should not be better served now than ever in the history of medicine. With present modes of transportation, the most isolated patient is not far from clinical laboratories and from the advice of leaders and specialists in the profession. Roads are generally open, so that it is rare for a call to be unanswered, though the country doctor even yet can tell some tales of difficult trips. The latest and comprehensive survey shows

the medical field to be overcrowded, and though this is not true of all the country districts, yet in the average section, there are plenty of good practitioners to take care of even epidemics. The type of improvement which could be suggested would be the influx of a number of energetic and well-trained men in localities where needed, and interested in becoming family physicians rather than specialists.

(b) Is the present cost of medical care in an average community too high? In order to examine this condition, let us divide the community into three general classes, the well-to-do, the middle class, and the poor. The first class, the well-to-do, need little comment. They pay their way and very often a little more, or at least they are able to.

The second class is much the largest. Many of its number have a little property, which is not income producing during this time, so that with the best will to pay, they have great difficulty. A large section of this group have in recent years invested beyond their ability to pay, have become the victims of too much credit, and as a result they have become disgruntled. They have lost their pride and self-respect as far as paying their debts is concerned, and have adopted a "laissez faire" attitude. However, the majority of this class will meet their obligations, provided normal conditions return.

The third class contains the poor, and may be divided into two groups, those that eke out an existence, but without any reserves for extras, like medical care, and those who are dependent upon charity, public or private. Physicians everywhere have always been willing to aid and give freely of their services. It certainly must be a rare occasion where a physician refuses to render services where needed. It is true that he would like to choose where to give his charity, but in small communities he has no choice, and he cares for the needy without complaining.

Analysis of the three general classes that make up a rural community would seem to indicate that for them the cost of medical care is not prohibitive. The most serious problem at present before the medical man who deals with them is to get his pay out of a certain percentage of the second class, who could pay but are not willing. For some reason in the general financial upheaval, they have acquired a sense of security that they will be taken care of whether they pay or no. Fortunately

this class is not large, and a course of education as to their obligations as a part of society would be well worth while, not for the benefits to their physicians, but to society as a whole. The government could use the printing press and postal department to advantage in teaching good citizenship.

The free service given to the worthy indigent is a pleasure, because it is appreciated, but the services given to the worthless and undeserving is a problem that reaches deep into the fabric of medical practice. The word MORATORIUM which has been used so freely of late in international, national, state, and private affairs, has given a certain class a moral support to which they are not entitled. Physicians, merchants, and others who have got their names in the papers by writing off debts owed them, are a menace to society. It is a cheap brand of advertising, bad economics, and a form of philanthropy, if, indeed, it can be considered philanthropy, that can only lead in the public mind, to confusion concerning the nature of just obligations. Every professional or business man writes off a certain number of accounts every year. This is his private charity, and he feels no necessity for broadcasting it. He has a duty as a citizen to assist in making better citizens, and that can not be done by aiding delinquency.

The majority of the public are fair minded when treated with fairness, and fairness means service. They recognize the physician as their servant; he is a necessity in the community which he serves, and entitled to a just compensation for services rendered. The rural physician should not consider himself a "forgotten man" but must assert himself as to his sphere in medicine. His patients are not willing to make radical changes from the present friendly humanitarian relationship to one of a cold scheme of taxed, socialized, state or insurance medicine. The time has come when the "pack horse of the profession" must follow the leaders of organized medicine. They must do their part in every way to stop governmental interference in medicine, and lessen the tendency towards bureaucracy.

The case against any form of socialized or state medicine would seem to be complete. The rich and well-to-do would not favor any such project, nor in the event of its inception would they patronize it. A large percentage of the middle class would not give up their

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Transitory Ether Anesthesia

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A TRANSITORY ether anesthesia may safely be induced by the accelerated inhalation of a minimum amount of ether and a maximum amount of oxygen, whereby most of the minor surgical cases, such as opening of felons, the reduction of dislocations, adjustments of fractures, or the extraction of teeth, may be painlessly performed without any depressing after-effects from the anesthetic.

At first the patient is put in a comfortable frame of mind, and is induced by the anesthetist's emphatic assurance that the narcosis is only transitory and that no sensation of pain from the surgical interference, or manipulation, will be felt. This assurance must be emphatic and of such import that the patient is to a certain degree in a state of hypnosis. The word danger is not alluded to, as it would disillusionize the individual, the mental anoci association would be disturbed and the tranquility previously induced be lost.

From five to ten cc. of ether is poured over the stockinet of an ordinary ether mask, and this is held for a few moments about a foot above the patient's face, while the anesthetist commands the patient to draw deep inspirations as rapidly as he can, which are about thirty a minute. After the fourth or fifth inspiration the mask is put close to the face, the anesthetist at the same time assuring the patient that the choking sensation will rapidly disappear after the seventh or eighth respiration. After a minute's time, or after the completion of twenty to thirty respirations, the patient falls into a deep, but transitory, narcosis, the duration of which is about three minutes, when consciousness rapidly returns.

The increased number of voluntary deep respirations produce carbon dioxide in the body itself. The thorax is filled with air and ether fumes, due to the vasometer action of the respiratory system, while the danger of acapnia is nil. Atelectasis is an unwonted complication. The narcotized individuals wake up as if from a pleasant dream, and no ill

after effects, such as vomiting or disturbances of the stomach have been observed. During this brief anesthesia there is only a slight increase in the pulse-rate, and there is no appreciable deviation from the normal blood pressure. This method has been used by me and my associates for a number of years and the total cases so anesthetized averages from thirty to forty a year.

A successful administration of this anesthetic by such an evanescent method combines a minimum amount of ether and a maximum amount of suggestion, as the method is to a limited degree suggestive hypnotism.

A number of dentists have for decades employed deep and rapid respirations with the view of lessening the activity of the sensory centers of the brain by hyper-oxidation, and if to this is rapidly added the chemical substances of ether supplemented in the blood stream surging through the brain, anesthesia is rapidly induced by a minimum amount of the drug.

CLINIC

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to fail, because you have fascial sutures and they will not disappear. He penetrates the uterus quite deeply, and penetrates for about an inch to an inch and a half practically the whole side of the posterior wall, and those two strips act as a swing so that the uterus is held up. I think that will hold the same way as your recurring hernias will hold with fascial sutures where they won't hold with ordinary things. I have seen it used twice and I think it is a very beautiful procedure.

DR. L. L. PANKOW: Do you ordinarily do your vaginal work and your suspension work in one operation?

DR. McGOOGAN: Yes, unless the fascial work is very extensive. Usually you can complete the two within an hour and a half.

DR. A. S. RIDER: Do you use silk?

DR. McGOOGAN: Yes. (Applause.)

Present Status of the Out-Patient Department

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THE out-patient department of a hospital stands midway between its forerunner, the old-fashioned dispensary of fifty years ago, and the modern diagnostic clinic which represents the most recent development in group medical practice. Some out-patient departments can be classified as little more than dispensaries. A few such as the Vanderbilt and Cornell Clinics are the equivalent of the best of the diagnostic clinics. The earliest dispensaries were established as a charity measure to take care of the indigent patient who was ambulatory. Little was attempted beyond an inadequate history, a brief examination, and drug dispensation.

Four types of clinics now exist in the United States. According to Plumley '32, the present census of these organizations are as follows:

CLINICS IN THE UNITED STATES

Out-patient Departments of Hospitals	2,042
Independent (Unattached) Clinics (Exclusive of Group and Industrial)	4,535
Known Total	6,577
Group Clinics (Estimated)	150
Industrial Clinics (Estimated)	1,000
Estimated Total	7,727

It is most difficult to compare the relative merits of the various organizations within any one of these four groups and even more difficult to draw conclusions concerning the relative value of the clinics between groups. The following questions must be answered in order to evaluate the Out-patient department of a hospital.

1. Does the charter or ordinance restrict its activities?
2. What is the quality and type of service?
 (a) Professional? (b) Administrative?
3. What are the sources and amount of its income?
4. Is it an entity or an integral part of the hospital?
5. Are there adequate space facilities?
6. Are the laboratory and x-ray equipment sufficient?
7. What type of case is handled?
8. Is an ambulatory service available whereby the patient can be boarded if necessary?
9. To what degree is teaching a part of the out-patient department?

10. Are good records kept?
11. What therapy is available?

Consideration of these factors will serve as a measure of the functions and activities of an out-patient department.

The number of out-patient departments has doubled in a decade. Quoting from data of Plumley '32, it is obvious that the increase has been one of general nature throughout the entire United States.

GENERAL OUT-PATIENT DEPARTMENTS IN THE UNITED STATES*

Location	Number	
	1921	1931
New England	86	159
Middle Atlantic	302	445
South Atlantic	36	187
North Central	105	227
South Central	59	209
Northwest Central	61	137
Far West	54	198
Total	703	1,562

*Under the heading "General Dispensaries" in the 1921 report were included out-patient departments of general, children's, industrial, and maternity hospitals. The same groups are used in this table for 1931.

The smallest relative increase of 47 per cent is found in the Middle Atlantic States where the movement originated and had already gained considerable momentum. The largest increase was in the South Atlantic States, amounting to over 400 per cent.

It is extremely interesting to note that this growth in hospitals with out-patient departments has gone on at a particularly fast rate in the industrial type of hospital and at a slow rate in those institutions which deal with chronic, non-ambulatory patients such as institutional and nervous and mental.

The growth measured in terms of number of visits demonstrates that not only has the number of departments increased over the last decade but that the average load carried by each out-patient department has almost doubled in the last four years.

VISITS TO OUT-PATIENT DEPARTMENTS IN THE UNITED STATES 1927-1931

Location	No. of O. P. D.'s		No. of Visits	
	1927	1931	1927	1931
New England	198	228	1,336,854	2,095,072
Middle Atlantic	577	564	7,098,848	11,008,028
South Atlantic	214	224	714,994	1,051,795
North Central	334	322	2,033,227	3,421,072
South Central	273	251	817,404	1,943,662
Northwest Central	216	179	793,122	1,207,158
Far West	318	274	1,010,117	2,704,595
Total	2,130	2,042	13,804,566	23,431,382
Visits Per Institution	...	...	6,481	11,475

OUT-PATIENT DEPARTMENTS IN THE UNITED STATES BY LOCATION AND MEDICAL TYPE

Location	No. of Hospitals	General	Nervous and Mental	T. B.	Maternity	Industrial	Other	Institutional
New England	4 228	154	25	15	3	1	16	14
Middle Atlantic	564	406	34	28	17	5	57	17
South Atlantic	224	179	3	13	7	10	16	3
North Central	322	208	19	36	7	16	21	15
South Central	251	196	3	8	..	21	15	8
Northwest Central	179	130	6	13	3	9	11	7
Far West	274	191	7	21	1	27	17	10
Total	2,042	1,464	97	134	31	89	153	74
Hospitals of Each Type.....	6,613	4,309	587	509	145	142	487	434
Percentage of Hospitals Having O. P. D.'s	31	34	17	26	21	63	31	17

Any development as far reaching in character and as rapid in growth rate as that evinced by the out-patient movement could not occur unless there existed a need for this type of service. What are the elements of service rendered which make this development almost indispensable to efficient hospital management? What needs does it answer for the physician and the public?

1. It affords the lowest cost medical care for the ambulatory patient.

2. It is the most practical way to correlate the interlocking specialties and make possible the best type of diagnostic service.

3. It shortens the duration of hospital stay because it assures good follow-up care.

4. It is the most effective way of reducing diagnostic costs without cheapening the quality of service rendered.

5. With good supervision it is proving to be among the best of all methods for the practical clinical training of the student and doctor.

6. In view of the widespread and increasing unemployment and with the continual shrinkage of community purchasing power, the low cost represents the final way open for many people to secure good clinical advice without resorting to charity.

The relationship of the out-patient departments of state or charity institutions to the medical profession is concerned chiefly with the rules of eligibility for admission. Eligibility of the patient must be evaluated in terms of income, social conditions, and the cost of medical care involved. This is best summarized in the Transactions of the American Hospital Association, 1928, by the Committee on Out-patient Work:

INCOME AND RESPONSIBILITIES

Income:

1. The father's occupation and industry, wages, regularity of employment.

2. The industry and occupation of all adult members of the family: what they earn and what they contribute.

3. Membership in a lodge or insurance company from which the applicant can obtain sick benefit.

4. Charitable relief of any kind. (Sources?)

5. Other possible sources of income; property ownership, insurance return, home occupation, shop returns, boarders or roomers.

6. Savings.

Responsibilities:

1. The patient's expenditures.

2. The cost of maintaining the family when in its normal state.

Certain variable factors are considered in connection with the social and economic situation of the patient, such as:

1. The individual who is ill and the source of reference. Is it the breadwinner, the woman of the household, or a child?

2. Length of time of incapacity.

3. Alternatives open to patient.

4. Conditions of health of other members of the family.

The cost of medical care required is also considered in connection with the following items:

1. The type of illness.

2. The treatment necessary.

3. The type of medical care required and the approximate cost if obtained privately.

If the medical need is indefinite, the patient is admitted pending decision.

It is recognized, of course, that a true emergency involving life and death of an individual supercedes all admittance rules and regulations.

The future for the out-patient department is bound up with the general economic situation and the possible trends in the medical profession itself. In any event it has proven to be an efficient tool facilitating the diagnosis of difficult cases. It places at the disposal of the profession technical equipment necessary for the diagnosis of difficult cases; it protects the hospital from filling its beds with ambulatory patients; and it lowers costs without cheapening high quality in scientific medical diagnosis. The out-patient department fulfills a very essential and unique place in medical service. Although social and economic readjustments might bring changes which will more closely correlate its activities with those of practicing physicians, it has already proved itself to be an ancillary service of great value to the modern hospital.



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
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' Assn.
Great Northern Railway Surgeons' Assn.
Minneapolis Clinical Club

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MINNEAPOLIS, MINN., MAY 1, 1933

ANNUAL MEETING OF MEDICAL ASSOCIATIONS COMING

Physicians who would take advantage of the programs offered in this section during the next three months could find time for little else. There are two meetings scheduled for May, the South Dakota State Association at Huron on the 15th, 16th and 17th and the Minnesota at Rochester on the 22nd, 23rd and 24th. In June, the North Dakota Association will meet at Valley City on the first and second, and the American Medical Association will be in session at Milwaukee, Wisconsin on the 12th, 13th, 14th, 15th and 16th. The Montana State Meeting will be held at Anaconda July 12th and 13th.

The programs thus far announced are very attractive, and the places decidedly inviting. Huron, Rochester, Valley City, Milwaukee and Anaconda are wide-awake medical centers that furnish geographical variety and close competition when it comes to hospitality. Not only is it necessary that physicians who would keep abreast of the times in medical thought should attend scientific discussions but it is good and perhaps also necessary that they should get away from daily routine and have an opportunity to relax. We live in a region that so many come to for recreation and rest; we tell others how important it is that

they should take advantage of all this but how about the doctors who advise it? Let's prolong our stay in these delightful places after the meetings, swap a few stories and catch a few fish.

A. E. H.

MINNEAPOLIS SCHOOL DIRECTOR

The careless day of leaving politics exclusively to politicians is definitely on the wane. The comment "You can't get good men to run for public office" emits a hollow sound. When a physician has been persuaded to run for public office, his election usually guarantees the electorate honest and sympathetic administration of public affairs. In consideration of the sensible scientific approach to human problems which the practice of medicine itself engenders, the organized medical profession need not consider itself vainglorious in exerting efforts to see that it is represented in responsible civic or national offices. The records of physicians as legislators and administrators are open, clean, and creditable.

Physicians of Minneapolis will soon have an opportunity to lend both their votes and their influence to gaining proper representation in a civic administrative department that is irrevocably bound up with the problems of health: the city school board. Dr. Charles R. Drake, Minneapolis physician, has been persuaded to file for the office of school director. He filed for this office

two years ago but missed the nomination by a narrow margin.

Dr. Drake has four children in the public schools. He has shown an alert and intelligent interest in the problems affecting public schools and public health. The school situation is more critical now than ever before and the presence of a man of sound judgment and character on the school board will go far toward effecting a sane and sensible solution of the problem.

Primary elections are May 8. Physicians of Minneapolis will be doing themselves and their patients a real service if they lend tongues and ballots to assure themselves of representation in a far-reaching local office by working for the election of Dr. Charles R. Drake as school director.

A. E. H.

AVOIDING MALPRACTICE SUITS

The following suggestions are based upon the established law governing these matters and the underlying circumstances which have actually been concerned in malpractice claims.

1. Practice your profession on a plane of skilfulness equal to that prevailing in your community; higher if possible.
2. Give your patients adequate attention. Neglect is as bad as unskilfulness.
3. Avoid discussing your own or other doctor's patients with outsiders.
4. Keep accurate clinical records of each and every case, no matter how apparently trivial.
5. Use approved methods only.
6. Use X-rays adequately in all bone and foreign body cases. Keep the films, properly marked for identification, in your own possession or in your roentgenologist's files.
7. Encourage consultation when in doubt or if the patient or his family ask for it. Get the best available.
8. Never operate on minors without the explicit consent of the nearest relative or guardian and then do no more than you agree, except in life-saving emergency.
9. Do not operate on adults with your hands tied by undue restrictions. If patients trust you with their lives they must also trust your judgment.
10. Do not begin to take legal action to protect your old accounts until the statute of limitation covering torts has expired. Many malpractice claims are merely unjust reprisals to avoid payment for well-rendered professional services.
11. Remember that the doctrine of "res ipsa

loquitur" (the thing speaks for itself) does not apply in malpractice claims. If you are unfortunate enough to have a bad result in spite of average skilful treatment and proper attention to the after care you are not liable.

12. A faulty diagnosis is not of itself cause for an adverse verdict if it occurs in spite of the skilful use of adequate diagnostic methods.

13. Do not neglect under any circumstances, to keep yourself protected by physicians' liability insurance.

14. Do not perform an autopsy without the written consent of the nearest relative.

15. Be especially careful of dosage in X-ray or radium therapy.

16. Do not administer any serum without first testing the patient for sensitiveness.

17. Never administer a general anesthetic without the continual presence of a third person.

18. Never let an instrument, a sponge, a pack or anything else of like nature get out of your sight in a cavity.

G. C.

NEPHROSIS AND NEPHRITIS

We have the highest regard for the researcher who, dissatisfied with prevailing classifications, would change them to better explain the phenomenon involved. To keep up with such progress, however, is not so easy.

In the popular mind, Bright's disease and nephritis have long been synonymous because no satisfactory distinction could be made without going into great detail. At most, when the attendant was pressed for an explanation, he might have said that we had acute and chronic nephritis and that Bright's disease was one of a subdivision of the latter, also known as chronic interstitial nephritis, contracted kidney or *schrumpfnieren*.

Many have been confused by the terms nephritis and nephrosis and there has been much misunderstanding about their proper use and meaning. Although nephrosis, strictly speaking, means any kidney disease, it has more often been used to imply those kidney diseases that could not be set down under the classification of nephritis.

Now, it would appear that the modern tendency is to consider that there is no distinct line or division, and that pure nephrosis, in such sense, is rarely if ever encountered as an entity without some co-existing nephritis. Evidently further reclassification is due, and we may have nephrosis with or without nephritis listed and defined.

A. E. H.

Proceedings Minnesota Academy of Medicine

Meeting of March 8, 1933

THE regular meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 8, 1933. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. C. D. Freeman. There were 55 members and one visitor present.

Minutes of the February meeting were read and approved.

Dr. A. S. Hamilton read the following memorial to Dr. Thomas G. Lee; and a motion was carried that it be spread on the minutes of the Academy and a copy sent to the family.

DR. THOMAS G. LEE, the last member of the original faculty of the College of Medicine of the University of Minnesota to retire from teaching service, died September 1, 1932, from injuries received in an automobile accident four days previously.

Dr. Lee was born in 1860 at Jacksonville, New York. He was graduated from the University of Pennsylvania in 1886 and held the degrees of Bachelor of Science and Doctor of Medicine from that school and, later, of Bachelor of Science from Harvard. For five years he was lecturer in Histology and Embryology at Yale University and also taught the same subjects at Radcliffe College for one year.

When the Medical School of the University of Minnesota was organized, Dr. Lee, in 1892, was given charge of the laboratory of Histology and Embryology, and also of Bacteriology and Clinical Microscopy. The latter subjects were soon turned over to other men and Dr. Lee continued as Professor in Charge of Histology and Embryology. In 1908 he became Professor and head of the Department of Anatomy and in 1913 he was made Professor of Comparative Anatomy and continued in this position until his retirement from active teaching in 1929 when he went to Florida to spend the remainder of his days.

When Dr. Lee came to the University, the Medical Department was limited in attendance and in quarters. With Dean Wulling he shared a one-story frame building and the building that was to house the medical, dental and pharmacy departments was then in the process of erection. The medical course covered two years only.

Dr. Lee saw the Campus, and especially the medical Campus, steadily expand. He visited Europe in connection with the plans for a new Institute of Anatomy which was completed in 1913. For years Dr. Lee was Secretary of the Medical Faculty and was Librarian

of the Medical School. He taught with or under each of the University's presidents. All of his life was devoted to administration, teaching and research. He was an indefatigable worker, was especially interested in the embryology of certain mammals, published several papers on that subject, in which he was a recognized authority, and left a valuable collection behind him. During his lifetime he was a member of many scientific bodies including the American Association for the Advancement of Science, Sigma Xi, American Society of Naturalists, American Society of Zoology, American Medical Association, Minnesota Academy of Medicine, American Association of Anatomists and Anatomische Gesellschaft. He was also deeply interested in Masonry, was a Charter Member of the Acacia Masonic fraternity and was second Master of the University Lodge of the Masonic order as well as a Charter Member. He was President of the Council of Knights Templar of the Masonic order, as well as a Charter Member and a 33rd degree Mason.

Dr. Lee was a very modest man, taking little part in public life. He was a widely read man with a special knowledge of comparative and ancient religions. He enjoyed the loyalty and the affection of his colleagues and of his students. On December 21, 1887, he was married to Miss Emma Louise Shaw, of West Bloomfield, New York. Though no longer a member of our Medical Faculty, regard for his memory is joined with deep sympathy for his wife, who survives him.

(Signed) The Committee:

Arthur S. Hamilton, Chairman
F. R. Wright
S. Marx White

Upon ballot, the following men were elected to membership in the Academy: Dr. B. S. Adams (Associate) of Hibbing; Dr. H. W. Cook (Active) of Minneapolis; and Dr. H. L. Dunn (University) of Minneapolis.

The scientific program of the evening consisted of two papers.

TRICHOMONA VAGINALIS VAGINITIS

W. H. CONDIT, M.D.

Minneapolis

Abstract

It is with apology that I offer these remarks on a subject so generally discussed in recent medical literature, but I have three reasons for so doing.

First, all members of the medical profession, not excepting some with a dental degree, treat the vaginal outlet therapeutically.

Second, there are not a few in our profession who

do not recognize *Trichomona vaginitis* as a definite entity.

Third, it was my good fortune to have access to all publications by Dr. Hegner, Professor of Parasitology at Johns Hopkins University, who has done most extensive study on the Trichomonads the past six years.

Most gynecologists now recognize the condition known as *Trichomona vaginalis* vaginitis as a definite entity. My interest was aroused some two years ago in an endeavor to determine why the profession has not recognized the Trichomonads present in vaginal discharges as a primary or secondary etiological factor in the one hundred years that have elapsed since the first discovery of their presence in the vagina by Donn .

The first clinical report in American literature on the treatment of vaginal discharge associated with the presence of Trichomonads was presented by DeLee in the Illinois State Medical Journal in 1920. The second report was by Greenhill before the Chicago Gynecological Society in 1928, published in the Journal of the American Medical Association, May 3, 1931. This last report brought many inquiries from the profession, including many gynecologists who had not recognized a single case. Mathieu, Carl Davis, N. S. Davis, Singleton and others have contributed to the literature on this subject.

Conclusions: (1) *Trichomona vaginalis* vaginitis, if not proven, is an accepted entity.

(2) Diagnosis and treatment of the condition will result in the cure of many annoying symptoms accompanying the vaginitis and assist in lowering puerperal morbidity.

(3) A standard treatment has not been established but recommended procedures are sufficient to yield gratifying results.

DISCUSSION

DR. F. R. WRIGHT (Minneapolis): There were two things in this paper which interested me. One is the statement that this germ has been found in prostatic secretion. Now prostatic secretion is obtained by holding the meatus, massaging the prostate and collecting the secretion from the urethra. Therefore, you can't tell whether bacteria in the secretion are from the prostate or from the urethra. Some dozen bacteria are found near the meatus; as you go back farther in the urethra there are fewer, and the posterior is practically always sterile. So that, if bacteria are found in prostatic secretion, there is no way of telling whether they are from the prostate or the urethra.

The other point is about the use of soap. Soap is a solvent. When it is put into the vagina it washes out the secretions. The soap which Dr. Condit speaks of is a soft soap and not purified. Ordinary green soap contains an excess of alkali. It may be possible that, in washing out the vagina with this soap, it is the excess of alkali in the soap that does the work.

DR. J. L. ROTHROCK (St. Paul): The role of the *trichomonas vaginalis* in the pathology of vaginitis is

still undecided. Until comparatively recently it was considered a harmless organism which was frequently found in the vagina of women.

It was not until 1916 that H hne ascribed to it the role of an important etiological factor of vaginitis. He believed that it was not only the sole cause of many cases of vaginitis but that, instead of its being a harmless parasite, it frequently invaded the deeper structures and was responsible at times for vulvo-vaginal abscesses and other lesions beneath the superficial layers of the epithelium of the vagina; a position from which he was later obliged to recede.

In the years that followed, numerous papers appeared in German literature and opinion was pretty evenly divided. On account of the embargo on German publications occasioned by the war, these did not become accessible to American readers until about 1920. Since then this subject has been much discussed in American literature.

It is important that we keep in mind a few of its characteristic features. While it is possible to grow it on artificial media, no one has yet been able to procure it in pure culture.

Inoculation of the vagina of healthy women with the organism grown on artificial media or even with vaginal secretion obtained from a case of vaginitis, fails to produce the disease.

It is frequently found in the vagina of women who show no sign of vaginitis.

It is limited in its distribution to the vaginal tract and vulva, involvement of the external genitals being probably made possible by irritation from the discharge.

It does not invade the uterine cavity.

There is no specific treatment but it yields promptly to various antiseptics.

Are we justified, therefore, in speaking of a *trichomonas* vaginitis?

The pronounced tendency to recurrence, which has been emphasized as a proof of its specific etiology may possibly be partly explained by a lowered resistance in certain individuals on the ground of constitutional disease with the disturbance of the balance of the endocrine glands just as we recognize that the invasion of the vagina by pathogenic bacteria is favored by such disturbance.

In point of its clinical importance it is interesting to call to mind the frequency of vaginitis in pregnant women with its possible bearing in the production of puerperal morbidity. The weight of opinion today is that it does not tend materially to increase it. Nevertheless it is important that vaginitis occurring in pregnant women should be promptly treated.

If this discussion has accomplished no other result it has focused attention on the importance of rational treatment as applied to vaginitis, which I fear has fallen into neglect in recent years.

DR. CONDIT (in closing): I was very much interested in Dr. Rothrock's remarks relative to lowered resistance in the female being a predisposing factor in the

occurrence of vaginitis. Minnesota Medicine of April, 1931, published a paper on non-specific vaginitis which I had presented before the annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at Niagara Falls, Ontario, September, 1930, in which I laid great stress upon this point of lowered resistance. I can recall many patients suffering recurrences of vaginal discharges on the occurrence of severe or mild infections, physical tire, or worry. We do find this flagellate in many human mouths and vaginae of patients in whom no symptoms of their presence or activity occur.

NOTE: Since the meeting of March 8th, I have received correspondence from Robert Hegner, Ph.D., Professor of Protozoology, Johns Hopkins University, which I offer here as a supplement to this discussion:

March 29, 1933.

Dear Dr. Condit:

I do not believe it is yet certain that *Trichomonas vaginalis* causes inflammation or vaginitis. Pure cultures of *Trichomonas vaginalis* have been grown many times. A correspondent from one of the Southern States claims to have brought about vaginitis in colored women by inoculating them with the flagellate, but he certainly included bacteria along with the trichomonads. I am not quite sure of your definition of a pure culture. Trichomonads do not appear to grow in culture medium in the absence of bacteria. As you state, the general impression is that *T. vaginalis* is pathogenic, and I am inclined to this opinion myself, but it certainly has not been definitely proven. I have recently obtained vaginal infections in monkeys with *T. hominis* from the intestine of man, but these infections seem to be temporary. I do not believe my previously published results prove anything more than that.

Very sincerely yours,

(Signed) Robert Hegner.

A. E. Benjamin, M.D., Minneapolis, read a paper on "Post-operative Peritoneal Adhesions," followed by a discussion.

The meeting adjourned.

R. T. LAVAKE, M.D.
Secretary.

SOCIETIES

THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

VALLEY CITY, N. D., MAY 31, JUNE 1-2, 1933

Wednesday, May 31, 1933

2:00 P. M. First Session of the Council.
7:00 P. M. First Session of the House of Delegates.

Friday, June 2, 1933

Session of the House of Delegates.
Session of the Council.

Thursday, June 1, 1933

- 8:30 A. M. Pediatric Clinic: F. C. Rodda, M.D., Minneapolis.
- 10:00 A. M. Orthopedic Clinic: Melvin S. Henderson, M.D., Section of Orthopedic Surgery, Mayo Clinic, Rochester, Minn.
- 1:30 P. M. Address: Paul H. Burton, M.D., President, North Dakota State Medical Association, Fargo, N. D.
- 2:00 P. M. Paper: "Intussusception," F. C. Rodda, M.D.
- 2:45 P. M. Paper: "The Diagnosis and Treatment of Primary Uterine Bleeding," A. M. Brandt, M.D., Bismarck, N. D.
- 3:15 P. M. Paper: "Legislative Matters," L. W. Larson, M.D., Bismarck, N. D.
- 4:00 P. M. Paper: "Diabetes Mellitus," Frank I. Darrow, M.D., Fargo, N. D.
- 7:00 P. M. Annual Dinner.
Address: "Cancer Control in North Dakota," Frank L. Rector, M.D.
Address: "Medical Publicity," L. Benschopf, Editor, The Detroit Record, Detroit Lakes, Minn.
Address: "Guild Medicine," Richard E. Scammon, M.D., Dean of Medical Sciences, University of Minnesota, Minneapolis.

Friday, June 2, 1933

- 8:30 A. M. Clinic: "Diseases of the Thyroid Gland," John de J. Pemberton, M.D., Mayo Clinic, Rochester, Minn.
- 10:00 A. M. Paper: "The Promotion of Preventive Mental Medicine," John D. Carr, M.D., Superintendent, North Dakota State Hospital, Jamestown, N. D.
- 10:45 A. M. Paper: "Treatment of Persistent R. O. P. Position," J. F. Hanna, M.D., Fargo, N. D.
- 11:15 A. M. Paper: "Coronary Thrombosis," Alano E. Pierce, M.D., Minot, N. D.
- 1:30 P. M. Paper: "Carcinoma of the Rectum and Rectosigmoid," John de J. Pemberton, M.D., Rochester, Minn.
- 2:30 P. M. Paper: "The Treatment of Fractures of the Spine," R. H. Waldschmidt, M.D., Bismarck, N. D.
- 3:00 P. M. Paper: "A Plan for Tuberculosis Control in North Dakota," Robert W. Allen, M.D., Director, Bureau of Preventable Diseases, Bismarck, N. D.
- 3:30 P. M. Paper: "Rectal Anesthesia in Obstetrics," J. D. Graham, M.D., Devils Lake, N. D.

The above is a tentative program for our State Medical Association Meeting here on May 31st, June 1st and 2nd. The arrangement is not permanent, and we have a few additions in the nature of time, etc., for discussions.

Will H. Moore, M.D., Valley City
Wm. Campbell, M.D., Valley City
C. J. Meredith, M.D., Valley City

Committee, Scientific Program.

Child Health Day

Throughout the country, proclamations pertaining to Child Health Day, May 1, by mayors, governors, and even the President of the United States and the Congress of the United States, are being read in churches, schools, and other public meeting places. They are being published in newspapers, magazines, etc. In the City of Minneapolis, the Mayor's proclamation, together with valuable health material, prepared by Dr. F. E. Harrington, Commissioner of Health, will be distributed in pamphlet form through the churches of all denominations on Sunday, April 30. The Journal-Lancet is pleased to present here a few pages from this pamphlet, which is not only in preparation for Child Health Day but is the beginning of a great campaign against communicable diseases, particularly diphtheria and smallpox, among Minneapolis children. The Commissioner of Health, co-operating very closely with the Hennepin County Medical Society, has developed a plan whereby an opportunity will be given for all children to be immunized against diphtheria and smallpox. During the first few weeks of this campaign, parents will be urged to take their children to private physicians. This is a splendid example of close co-operation among the public health authorities, the churches, and the practicing medical profession in an attempt to further control communicable diseases among children.

THE CHURCH AND COMMUNITY WELFARE

The physical as well as the moral and spiritual health of the community is always a serious concern, and in furthering this vital interest the churches stand ever ready to cooperate with those who by reason of their scientific investigations, authoritative position and accredited wisdom are naturally and logically assumed to be the most capable of prescribing the means and methods of preventing and treating diseases.

In our day preventive medicine has progressed so far that the table of mortality existing from certain preventable diseases of an epidemic character has completely reversed the order of proportionate fatality.

We strongly urge all those responsible for the men, women, and children in our churches, schools, and homes to lend their aid in whatever program may be initiated for the security of our entire population.

Given under our hands this 30th day of April,
1933.

John G. Murray *Harry P. Dewey*
W. P. Christy *Rabbi Albert G. Minda*

Most Reverend John Gregory Murray, D.D., Archbishop Catholic Diocese, St. Paul
Reverend Harry P. Dewey, D.D., President, Minneapolis Church Federation
Reverend William P. Christy, President, Minneapolis Lutheran Pastors' Conference
Rabbi Albert G. Minda of Temple Israel



City of Minneapolis

OFFICE OF THE MAYOR

WILLIAM A. ANDERSON
MAYOR

A PROCLAMATION OF

WILLIAM A. ANDERSON, MAYOR OF THE CITY OF MINNEAPOLIS

ANNOUNCING MAY-DAY AS CHILD HEALTH DAY

WHEREAS, The Congress of the United States by joint resolution has proclaimed May-Day as Child Health Day; and,

WHEREAS, The responsibility for the health and well-being of children is a community responsibility and an individual duty; and

WHEREAS, The prevention of communicable diseases is a community responsibility as well as an individual duty; now

THEREFORE, I, WILLIAM A. ANDERSON, Mayor of the City of Minneapolis, do proclaim May 1, 1933, as May Day-Child Health Day for the consideration of all measures by which health and well-being of our children may be conserved and advanced.

DONE, at the City of Minneapolis this 23th Day of April, 1933.



William A. Anderson

Mayor.

City of Minneapolis

DIVISION OF PUBLIC HEALTH

CITY HALL

F. E. HARRINGTON, M.D.
ASSISTANT COLLABORATING EPIDEMIOLOGIST, U. S. P. H. S.
COMMISSIONER OF HEALTH DIRECTOR OF HYGIENE

April 30, 1933

Smallpox and diphtheria are contagious diseases which only exist where people fail to heed the advice of their health counselors. These diseases prevail and deaths occur where health authorities have been unable to impress upon the people the importance of preventive measures.

Children are dependent upon their elders for health, happiness and protection. No child should be deprived of his rights to the safeguards of health and life. Now is the time to heed the advice from your health authorities - Protect the children and yourself so that smallpox and diphtheria may be unknown to Minneapolis. Consult your physician and have him apply these preventive measures now. Should an epidemic occur it may be too late.

Good health is the first step in public welfare. The welfare of Minneapolis depends upon good citizenship.



F. E. Harrington
(F. E. Harrington, M.D.)
Commissioner.

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. W. Morsman, Hibbing, Minn., was recently married to Miss Mabel Hay of that city.

Dr. H. B. Aitkens, LeCenter, Minn. has just celebrated his 39 years of active practice in that city.

Dr. Charles F. Cervenka is again located at New Prague, Minn., where he has opened offices for general practice.

Dr. J. W. Byram, formerly located at Echo, Minn., has moved to Redwood Falls and opened offices for general practice.

Dr. A. J. Carr, Fargo, has been spending several weeks at the Mayo Clinic in taking a special post graduate course in surgical work.

Pukwana, S. D. are very anxious to have a general practitioner locate in their village. Address the Chamber of Commerce for information.

Dr. G. J. Ferreira, County Health officer at Duluth, died on April 13th, at the age of 38 years. He was a graduate of the University of Chicago.

Dr. Martin Nordland, Minneapolis, will be one of the speakers at a meeting of the American Association for the Study of Goiter, to be held at Memphis, Tenn., May 15-17.

Dr. George M. Jennings, Missoula, was elected president of the Montana State Board of Health for the coming year, and Dr. E. M. Porter, Great Falls, as vice-president.

Dr. H. Bradley Troost has joined the staff of the Mankato Clinic, and will specialize in internal medicine. Dr. Troost was graduated at the University of Minnesota in 1930.

Dr. Wyman Smith, Minneapolis, aged only 29 years, died very suddenly on April 20, the result of blood poisoning. Dr. Smith was a graduate of the Northwestern Medical School.

At the April meeting of the Washington County Medical Society held at Stillwater, Minn., Dr. E. H. Hammes, St. Paul, gave

an illustrated lecture on "Neurological Diagnosis."

Dr. James P. Ayles, Fargo, N. D., has been named superintendent of the Institute of the Feeble Minded at Grafton, N. D. Dr. Ayles has been in active practice in North Dakota since 1888.

The Battle Mountain Sanitarium, Hot Springs, S. D. will not be closed as recently reported, but will continue to operate on account of its centralized location in service of six states.

The April meeting of the Scott-Carver Medical Society was held at Jordon, Minn., with the guest speaker being Dr. J. O'Brien of the University of Minn., who spoke on "What Everyone Should Know About Cancer."

The ninth annual meeting of the North Dakota Health Officers Association will be held at Bismarck on May 2 and 3. Dr. R. W. Allen is in charge of the program, which will bring many prominent speakers from other states.

About 50 physicians were in attendance at the April meeting of the District Medical Society, held at Grand Forks, and were entertained by an illustrated talk on "Recent Advances in Dermatology" by Dr. A. Davidson of Winnipeg.

About 50 members of the Red River Valley Medical Society were in attendance at their spring meeting at Crookston, Minn. After being served with a fine dinner a general discussion followed on topics of interest to the profession.

Dr. A. C. Tingdale, has been named as superintendent of the Minneapolis Workhouse, a position that he is well qualified to fill. The doctor has been in active practice in the city since his graduation from the University of Minn., in 1902.

Plans are under way in hospitals of the Minnesota Cities to stage special demonstrations and programs in observance of National Hospital Day, May 12. The day has been set aside by President Roosevelt in honor of the hospitals of the nation.

The annual meeting of the South Dakota Nurses Association held at Aberdeen last month was a marked success. Miss Mary E. Smith, New York; Miss Bessie Nicoll, St. Louis, and Miss Lucille Petry, Minneapolis, were the principle speakers.

The District Medical Society held their

quarterly meeting at Aberdeen, S. D. last month with three guest speakers on the program. Dr. N. W. Barker, Rochester, Minn.; Dr. C. W. Forsberg, Sioux Falls, S. D., and Dr. M. R. Gelber, Britton, S. D.

The quarterly meeting of the Park District Medical Society, was held last month at Fergus Falls, Minn., with a large attendance and two interesting papers were presented, Dr. J. C. Jacobs, Fergus Falls, "Thyroid" and Dr. Meland, Minneapolis, "Genital Urinary Diseases."

A scientific exhibit and an exhibit of X-ray films will be on of the attractions of interest at the annual meeting of the South Dakota State meeting at Huron. Dr. B. R. Kirkland of the Mayo Clinic will make an interpretation of films brought by members of the association.

The Park County Medical Society held their annual meeting at Helena, Mont., recently and the following officers were elected for the coming year: Dr. A. P. O'Leary, Big Timber, president; Dr. G. A. Windsor, Livingston, vice-president, and Dr. Paul Green, Livingston, secretary.

Dr. Herbert C. E. Meyer, well known physician of Sioux Falls, died at the Mayo Clinics, Rochester on April 15th, after an illness extending over a year. Dr. Meyer was a graduate of the University of Minnesota, and had been in active practice at Sioux Falls since 1926.

Dr. Erling W. Hansen, president of the Hennepin County Medical Society, was the guest speaker before the last meeting of the Minneapolis Association of Retail Druggists. Dr. Hansen presented an excellent paper on "Professional Relationships Between Physicians and Druggists."

Dr. Scamman, dean of medical sciences, University of Minnesota, was the guest speaker at the April meeting of the District Medical Society, at Sioux Falls, his topic being "State Medicine." About sixty physicians were present, including Dr. J. R. Westaby, Madison, S. D.; Dr. G. Cottam, Minneapolis, and others.

One Dr. F. J. Gath, concerning whose operations in violation of the Medical Practice Act, and who was arrested for unlawfully practicing medicine without a license, was convicted in the District Court of Towner County, Cando, N. D., for violation of the North Dakota Medical Practice Act. He was

sentenced to serve thirty days in jail, pay a fine of \$100 and costs of \$100 and to serve an additional 100 days in default of the payment of such fine and costs. He is now serving such sentence.

The Minnesota State Medical Association broadcasts weekly at 11:30 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 May will be as follows: May 3rd, Child Health—A Challenge; May 10th, Galvanic Mouth Burns; May 17, Medicine of the Aborigines; May 24th, Dementia Praecox; May 31st, Periodic Health Examination of Women.

On the opening day of the Minnesota State Medical Association, on May 22nd, nine special societies' meetings will be held during the afternoon, while in the evening, medical economies will be discussed by Drs. Fishbein, Chicago, C. H. Mayo, Adson, Rochester, and Johnson, Dawson, Minn. Tuesday evening they will have the following prominent speakers on their program: Archbishop John Gregory Murray, St. Paul; Dean Lewis, Baltimore, president of the American Medical Society, and Dr. N. O. Pearce, Minneapolis, president of the Minnesota State Society. Dr. W. J. Mayo, Rochester, will be the presiding officer. A reception will follow for all visiting doctors and their wives.

THE RURAL PHYSICIAN AND THE COST OF MEDICAL CARE

(Continued from Page 253)

close relation to their family physician, with the friendships that are part of its intimacy. The institutionalized poor are already efficiently cared for, while the occasional victim of loss or privation can be and is dealt with privately.

It would be impossible to arrange any one scheme that would serve all types of communities, and the public as a whole would not consent to any more bureaus and tax schemes. The majority are willing to pay for what they get, while those fortunate enough not to be sick would scarcely be willing to pay anyway. The rural physician, the family physician, has more to offer the individualistic rural communities than any board or society however organized and constituted.



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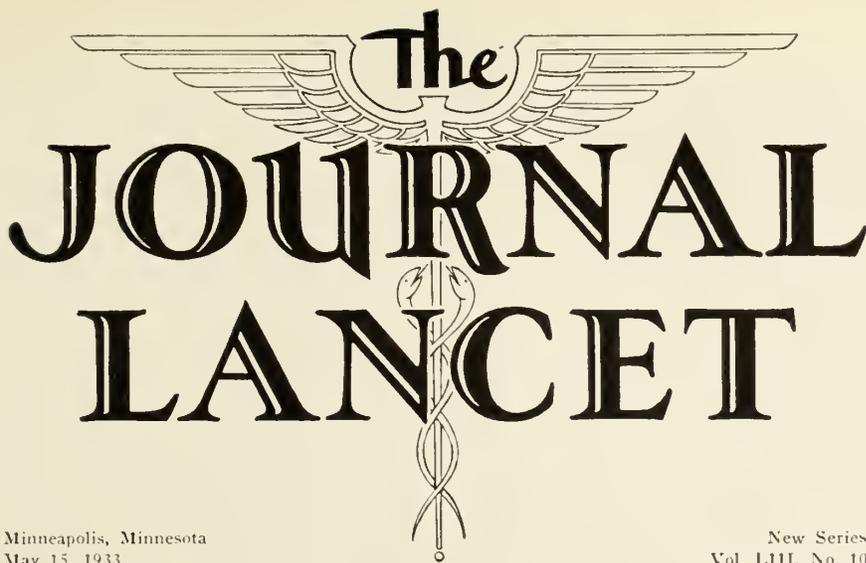
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Hyperthyroidism: End-results in a Series of Cases Four Years or More After Surgical Treatment*

Leo Murphy, M.D.
Minneapolis

INASMUCH as the membership of the Minneapolis Clinical Club is representative of the various branches of the science of medicine I shall attempt in this discussion of Hyperthyroidism to remain as far as possible within the zone of general considerations to the end that some few points at least may prove of interest to those not engaged strictly in the fields of internal medicine or surgery. Although the opportunity is indeed a tempting one I shall refrain from the delineation of details of surgical technique, preferring rather to outline roughly the evolution of the surgical treatment of goiter and to present the end-results in a series of 100 cases of Hyperthyroidism upon which I performed thyroidectomy prior to four years ago.

The story of the development of the operation for goiter, so masterfully related in Halsted's scholarly monograph, is among the most interesting and dramatic of all surgical history and through its chapters runs the essential history of surgery in general. Almost incredible are the heroic attempts of the earlier surgeons in the face of difficulties which today would be regarded as positively prohibitive. For thousands of years goiter has been a familiar malady in many countries in which large numbers of the population were afflicted. These huge deforming tumors of the neck were for a long time regarded

either as incurable, inoperable growths or as God-given afflictions to be patiently endured. Among the ancients attempts were made to distinguish types of tumor masses in the neck and apparently there was much confusion with swollen lymph glands and scrofulous abscesses. It is written that Celcus in the first century A. D. described unmistakably a cystic goiter and that he undertook the extirpation of it. Through the early and middle centuries many unauthentic instances of the attempted removal of goiter are alluded to in historical writings. We read that in Bagdad in the tenth century Albucisus, emboldened by his experience of having been able on one occasion to control hemorrhage by ligature and the hot iron, risked the operation. Covering the period from Celcus to 1861 there is record that 106 actual cutting operations for goiter were in all probability performed. The earliest of this authentic list is reported to have taken place in 1595 when an empiric attempted to remove a goiter in the case of a ten-year-old girl. She died under the operation and the surgeon was imprisoned. In 1770, Benjamin Gooch in England gave a quaint account of an operation for goiter performed by one of London's most dexterous operators which came very near ending in a fatal hemorrhage. "The life of the patient (also a young lady) was preserved only by having a succession of persons to keep con-

*Read before the Minneapolis Clinical Club, March 9, 1933.

stant pressure upon the bleeding vessels day and night for nearly a week with their fingers upon proper compressors, after the operator had been completely disappointed in the use of the needle and ligature." In France as early as 1791 Desait performed a successful thyroidectomy while in another case he attempted the operation with the assistance of two people whom he came across accidentally. The patient died from hemorrhage. By the year 1800, Hedenus in Dresden had removed six suffocating goiters with very little loss of blood and without a death, a truly remarkable feat which with neither anesthesia nor antisepsis is hardly conceivable today.

In America the first removal of a goiter was done in 1835 by Nathan R. Smith of Baltimore, who quite probably had never before seen an operation upon the thyroid gland. His own modest description of it illustrates so vividly the handicaps of less than 100 years ago that it warrants quotation in part here. Apparently the goiter was of the huge pendulous type, ulcerated and sloughing at its dependent portion. The propriety of attempting a complete extirpation of the goiter in this patient was considered only after careful weighing of all of the circumstances of the case and since it was obvious that there was no rational ground for hope that any course of palliative treatment would arrest the progress of the disease or heal the ulcer. In his description of the operation, Dr. Smith wrote as follows: "As the sternomastoid muscle was retracted with some force such tension of the parts was necessarily produced as compressed the vein and imparted it of its blood. The wounding of the vessel under these circumstances was therefore scarcely to be avoided. Blood soon flowed freely from the wounded vessel, its flow being hurried by the struggling and deep breathing of the patient. I was perfectly aware of the great danger of the inhalation of air into the vein and the fatal consequences which might be expected to result in its reaching the heart in any considerable quantity. I therefore while making efforts to secure the vessel with the ligature was careful to grasp the border of the sternomastoid muscle including the lower portion of the vein with the finger and thumb. The vessel was secured with the armed needle; but notwithstanding my utmost care I twice distinctly heard gurgitation of a small bubble of air as it entered the vein in the moment of a strong and deep inspiration of the patient.

For a moment I desisted from the use of the knife and looked into the face of my patient to observe the effects of the ingress of air into the veins. Happily the quantity was not sufficient to produce any objectionable effect, and I proceeded with the operation. . . . As I progressed with the dissection of the tumor from the deep seated parts I found it necessary to proceed with extreme caution. . . . At length I succeeded in effecting a complete removal of the tumor. There was now a frightful chasm in the throat, the larynx being dissected quite bare especially on the right side and the trachea exposed as low as the border of the sternum. The great vessels from each side were also seen throbbing in their sheaths. The recurrent laryngeal nerve was distinctly seen on the right. The operation was necessarily painful and protracted; its execution occupying an hour; the patient, however, endured her suffering with wonderful fortitude and at no time did there take place any alarming sinking of the powers of life. Twice or thrice at her desire I had delayed a few minutes to allow her a moment of comparative repose, but neither then nor after the operation did there appear to have been inflicted any serious shock.

"In the morning on visiting Mrs. Wells I was alarmed at finding the dressings bathed in blood which was still flowing from the wound and evidently of the arterial hue. I immediately cut the stitches, opened the wound and turned out a mass of coagulated blood and found the bleeding to have occurred from a minute artery where the last attachment of the tumor had been cut away. I secured the vessel with the ligature and as there was a disposition to hemorrhage from minute vessels I applied to the part a small compress of lint dusted with alum powder. On the fifth day, however, there occurred a severe rigor followed by fever, sonorous and embarrassed breathing, cough and irritability of the stomach. It passed off with a sweating stage precisely as a paroxysm of intermittent fever. The wound which had supplicated kindly now began to exhibit a flabby appearance and to discharge an unhealthy secretion. It is not necessary that I should relate the subsequent progress of the case. Suffice it to say that the rigors recurred every day notwithstanding our endeavors to carry them and that the patient died on the 13th day. The chills were evidently of malarious origin and my patient undoubtedly came to me pre-

disposed to intermittent fever. To this in part I think I may with propriety ascribe the fatal result."

Several years later, E. S. Cooper of Philadelphia developed a method for control of hemorrhage by transfixion of blood-vessels which proved to be one of the most important of all contributions to the development of surgery. During this same period numerous operations for goiter were being performed by the German, Austrian and Swiss surgeons largely with discouraging results. With anesthesia unknown or in its infancy, very meager knowledge of dealing with blood-vessels and antisepsis not yet established, it is not difficult to perceive that the frequent and tragic deaths from hemorrhage and infection should have stirred up a high wave of wide-spread condemnation upon the operation. In France the procedure was emphatically condemned. In Leipzig, Diefenbach declared it to be "one of the most thankless, most perilous undertakings, which if not altogether prohibited should at least be restricted to certain varieties of the malady." In Philadelphia in 1866 Dr. Samuel D. Gross protested in a spirited rebuke that "no honest and sensible surgeon would ever engage in it."

The second chapter of the story introduced the two most important contributions the world of medical science has ever known: Anesthesia from America and Antisepsis from Great Britain. Later, with the introduction of artery forceps and the development of effective methods of hemostasis, the number and magnitude of operations promptly increased the world over. During the fourth quarter of the 19th century the most valuable contributions came from the clinics of Theodore Kocher in Berne and Theodore Billroth in Vienna. Among these were the importance of avoiding injury to the recurrent laryngeal nerves and the observation that in the event of paralysis of one vocal cord the other one compensates going past the midline to approximately its paralyzed fellow, this compensation being responsible for the return of more or less normal voice; also the occurrence of Tetany following the total extirpation of the gland. For the establishment of a systematic operative procedure evolved with a definite rationale and designed to avoid the three great dangers then known to exist, hemorrhage, nerve injury and infection, we owe a large debt to these two pioneer surgeons. Mikulicz made the important observation that Myxe-

dema and Tetany did not develop if a portion of the thyroid gland were allowed to remain, and it is from this now established fact that we have our present type of subtotal resection of the thyroid. These fundamental principles have come down to us essentially unchanged.

From this point on refinements and modifications of the operative technique were added in this country by Halsted, and later by C. H. Mayo, Crile and others. The operative mortality became progressively reduced as larger numbers of operations were performed and as the treatment of Hyperthyroidism became more definitely established. Methods of estimation of metabolism were developed, clinicopathological correlations were drawn and practical classifications were formulated. Knowledge of the physiology of the thyroid had been derived largely from clinical observations made on pathological conditions occurring in it. For instance, in young people it became known that atrophy or aplasia of the thyroid was associated with the condition we know as Cretinism and that in adults a like degree of deficiency or both produce Myxedema. In 1914 Kendal separated Thyroxin as a pure chemical substance, the active product of the thyroid gland. So far as is known, the chief function of the thyroid gland is to produce and to deliver a sufficient amount of this product daily to the body to maintain the metabolism at a normal level. The production and delivery of Thyroxin in excessive amounts result, as a rule, in the clinical entity known as Hyperthyroidism. That two distinct types of Hyperthyroidism occur is quite generally accepted. From the surgical standpoint differentiation of the Hyperthyroidism of so-called Exophthalmic Goiter from that of Adenomatous Goiter is particularly advantageous since it is known that the two do not always withstand a given operative procedure with equal degrees of safety. As a consequence, quite different methods of surgical approach may be required in the two types of hyperfunctioning gland.

My report this evening is based upon a study of the end-results in a series of 100 cases of Hyperthyroidism which I treated surgically prior to four years ago. The data obtained, although elicited for the most part by questionnaire and therefore not considered to be entirely accurate, does serve, however, to indicate fairly closely, I believe, the relative percentages of successes and failures in this particular group of cases. Seventy-six

patients replied that following operation they were completely relieved of all symptoms and considered their recoveries to be complete. The designation "cured" is not employed here since it is not possible for us to de-limit the period in which recurrences may appear. A second group of eighteen reported "definite improvement but not complete relief of symptoms," that is to say, "incomplete recovery." Four patients stated that they were unimproved. There were two surgical deaths. Of the 100 cases of Hyperthyroidism, 62 were Exophthalmic Goiters, 37 Toxic-adenomatous Goiters and 1 was a combination of the two types. Ninety patients are now living. Of the eight patients who survived operation but who are now deceased seven died in from two to five years; the eighth died following a tonsillectomy performed four months after the thyroid operation. The operative mortality for this series was 2%. Of the two surgical deaths, one occurred in either group, giving a mortality by group of 1.63% and 2.7% respectively.

The patient with Exophthalmic Goiter who died following operation was fifty-eight years of age. In her case a moderately severe degree of Hyperthyroidism had been present for several years, and she had been treated with a wide variety of agents, including Lugol's Solution over a period of time greatly exceeding its usefulness. That she was a poor surgical risk was readily recognized. After one month of observation and preparation, during which there was apparent improvement, ligation of the superior thyroid vessels was done. Since little or no reaction followed this procedure a right lobectomy was performed two weeks later. This was followed by a severe hyperthyroid crisis, and death occurred within twelve hours. In the other fatal case the patient was sixty-eight years of age and had carried a low grade of adenomatous hyperthyroidism over a long period of years. Death occurred from cardio-renal insufficiency forty-eight hours after operation.

All of the seven patients who died between two and five years after operation were in varying degrees benefited in the interval by the procedure. Five of these were women over sixty-three years of age who before operation presented the picture of advanced myocardial insufficiency with auricular fibrillation, the late effects of long continued, insidious, low-grade Hyperthyroidism. It was to this type that Dr. C. A. McKinlay referred in

his paper before this Clinical Club a few years ago. Following operation in these seven cases the conspicuous features of benefit were the prompt return of normal cardiac rhythm and compensation which, together with the relief of obstructive dyspnea in a few and the definite general improvement in all, gave convincing evidence that the operative procedures had been decidedly worth-while. In four of these patients the eventual cause of death was cardio-vascular in origin; in two the causes are not known; the seventh died only recently of carcinoma of the pancreas.

All four of the patients who reported unimprovement following their operations had been diagnosed as Exophthalmic Goiters as had also eleven of the eighteen who replied that their recoveries were incomplete. Of the four unimproved I have since re-operated upon three, with good results in two. In the third case a third operation was necessary, which, judging from a recent observation of the patient, appears to have given a completely satisfactory result. The fourth of this unimproved group, I believe, is definitely of the "effort-syndrome" or "adrenal-autonomic" type in whom originally an incorrect evaluation of the findings and underlying factors led me to an erroneous diagnosis and from that to what I now consider an unnecessary operation. Among the eleven patients now living who reported only partial improvement three have had secondary thyroidectomies with good results so far. One other known to be mildly hyperthyroid but not as yet re-operated upon has recently completed an uncomplicated pregnancy. Of the remaining seven, three have Essential Hypertension with symptoms readily simulating those of Hyperthyroidism, and in the last four cases the symptoms reported were such as to warrant the assumption that they were not thyroid connected. Preliminary operations, ligation or lobectomy, were performed in ten of the sixty-two Exophthalmic Goiters (16%).

Of the seventy-six patients who reported complete recovery two had Diabetes Mellitus concurrently with the Hyperthyroidism. In both instances the internist observed an increased sugar tolerance coincident with the lowering of the metabolic rate to normal limits. None of the cases in this series was associated with pregnancy.

The incidence of so-called "recurrences" in this group of one hundred cases is approxi-

(Continued on Page 272)

Dementia Paralytica

J. R. Ostfield, M.D.
Fargo, N. D.

THE following is a brief dissertation on an important clinical neuropsychiatric disease which frequently confronts and is sometimes overlooked by the general practitioner.

Dementia Paralytica is a chronic slowly progressing disease of the nervous system which shows frequent remissions and is caused by the *Spirochaeta pallida*. The name General Paresis is no longer used to designate this disease and Dementia Paralytica has been selected as the scientific name for this affection by the American Psychiatric Association.

The result of this disease is an essential mental and physical deterioration. It can be stated then Dementia Paralytica is a mental disease with physical signs occurring usually in the fourth and fifth decade of life in a small percentage of persons who have acquired or inherited syphilis. It was formerly thought to be a para syphilitic affection; however, the demonstration of the specific spirochete in the degenerative lesions of the brain, leaves no doubt as to the luetic nature of this infection. There is, however, some evidence to show that the organism may be of a special neurotrophic strain with special predilection for the nervous system. It is estimated that ten per cent of syphilitic individuals acquire neurosyphilis. Trauma and alcoholism may act as precipitating factors but are not the causative factors. The reason why some people acquire neurosyphilis and others do not is not known to science. The fact that one has received a course of intensive antisymphilitic treatment does not preclude the possibility of neurosyphilis; some patients who have taken no treatment escape neurosyphilis. The nervous system is affected early in the course of the syphilitic process. According to Boyd, of the University of Manitoba, the nervous system is infected as early as the second month. However, Dementia Paralytica does not occur till from five to fifteen to twenty-five years after primary infection with lues.

From the standpoint of pathology, Dementia Paralytica is both a meningitis and an encephalitis. The most characteristic feature of this disease is atrophy of the convolutions of the brain particularly the frontal and parietal regions of the brain. The dura is thickened and adherent to the

skull and the pia arachnoid is adherent to the cortex. The cortex is very vascular and there is a perivascular round celled lymphocytic and plasma cell infiltration. Within the substance of the brain there are inflammatory changes and cellular infiltrations surrounding groups of spirochetes. As a result of the endarteritic changes there is secondary softening and degeneration of the brain. One often finds degenerative changes in the posterior columns and in the pyramidal tract.

There is no single clinical picture at the onset of the disease. It is usually the mental changes which give the first clue to the presence of this clinical psychiatric syndrome. While at times the onset may be ushered in with an attack of acute mania or depression it usually displays an insidious onset. There is usually a change in the character and disposition of the individual. He may lose interest in his environment and become apathetic and moody. There may be the symptom of headache and a sense of pressure within the skull. However, it is not long before the picture becomes more specific; the memory fails, especially for recent events; there is a dulling in the intellectual sphere. Judgement becomes defective and the individual allows himself to become guilty of moral and anti-social acts. The parietic is usually a very contented individual and his feelings are usually of the euphoric nature. There are numerous grandiose delusions, though some authorities claim the ideas of grandeur are not as marked as many years ago.

The physical signs of Dementia Paralytica are quite clear cut. Fifty per cent of the patients show an Argyll-Robertson pupil in the early stages of the disease. In the later stages, nearly all parietics display some pupillary anomalies. However, a completely normal reacting pupil does not preclude a possibility of Dementia Paralytica. There is a characteristic change in the speech; there is slurring and omission of letters and syllables. Test phrases such as: "Round the rugged rock the ragged rascal ran," "Methodist," "Episcopal," are poorly repeated. The writing displays a tremulousness. Letters are often omitted and misplaced. There is usually a tremor of the lips, tongue and fingers. The deep reflexes, because of Pyramidal cord involvement, are usually increased, but they are frequently diminished. If

the disease involves the posterior columns, then the condition of Taboparesis prevails, one finds a positive Romberg, absent knee jerks and bladder troubles. In Dementia Paralytica one rarely finds a positive Babinski. Epileptiform seizures are frequent, particularly in the latter stages of the disease. The convulsions do not occur in all patients. A convulsion may be mild or severe and last from a few minutes to half an hour.

The blood and spinal fluid Wasserman test are positive in practically a hundred per cent of the cases. A lumbar puncture should be performed in every case of positive blood Wasserman, not only to exclude Dementia Paralytica but particularly asymptomatic neurosyphilis. The colloidal gold curve shows a paretic curve in Dementia Paralytica and is one of the most reliable signs of this disease. It is positive in ninety per cent of cases.

There are various types of Dementia Paralytica. The classical type is the Grandiose or Expansive type. Delusions of grandeur predominate in this group. A second type is the Manic type, which can be ushered in with an attack of acute mania. The third group is the Depressive group, characterized by simple depression and Hypochondriasis. The fourth type is the Simple Dementing type which is characterized by a simple progressive mental deterioration.

In the differential diagnosis one must consider a variety of diseases which in certain of their manifestations might simulate Dementia Paralytica. These are Cerebral Syphilis, Tabes, Epidemic, Encephalitis, Multiple Sclerosis, Cerebral Arteriosclerosis and Alzheimer's disease. However, the positive serology, the pupillary changes, speech disturbance, tremors, tendency to remission, should all point to Dementia Paralytica in case of doubt.

A few words may be stated in regard to treatment. The modern method is the malarial treatment. That is now past the experimental stage. The patient should be in an institution. He is inoculated with the tertian malarial protozoan taken from another patient, preferably during a chill, by the injection of the parasite intramuscularly or intravenously. Ordinarily three to five cc. of the donor's blood is used. Within ten days or two weeks the patient gets his first chill and is allowed to have eight or ten, when antimalarial treatment is begun. Treatment with malaria has a mortality rate of two or three per cent. If symptoms of severe anemia or cardiac failure supervene, then malaria treatment must be immediately terminated. The treatment may be given to young and vigorous paretics early in the course of the illness. In the advanced stages and in

physically deteriorated patients, treatment is not only of no avail, but may hasten death. It is contraindicated in decrepit individuals and those with syphilitic aortitis or myocarditis. With the malaria treatment remissions amounting to permanent cures occur in about thirty per cent of cases. Many a paretic, therefore, who apparently is destined to die or to remain in the institution, can be returned home to his family. Following the malaria therapy the anemia should be combated by the administration of some iron compound. It is important that the malaria treatment be followed by a course of Tryparsamide injections, the only danger in the use of Tryparsamide being the possible occurrence of optic atrophy.

HYPERTHYROIDISM: END-RESULTS IN A SERIES OF CASES FOUR YEARS OR MORE AFTER SURGICAL TREATMENT

(Continued from Page 270)

mately 7% if estimated strictly on the basis of the number of cases in which either the persistence or the return of symptoms should rightfully be attributed to Hyperthyroidism. The majority of these occurred in my earlier cases in which not enough gland was removed. In a later series there is promise of better results.

Among the various methods of treatment of Hyperthyroidism surgery has long been accorded the foremost place. Such pre-eminence to be continued must be merited in terms not only of low mortality but of low percentage of recurrences as well. The factors influencing and to a considerable extent determining the end-results are self-evident. Admittedly, surgical procedures cannot be depended upon to effect complete recovery in all cases and, conversely, it appears that not all cases need depend upon surgery alone for cure. Certainly the assistance of the internist is valuable in all cases and there is evidence to show that in certain instances irradiation may be employed to advantage. The efficacy of medical management alone and the length of time over which it may safely be conducted are still controversial questions. Surgical denervation of the adrenals has its field of greatest usefulness in the minority of cases of recurrent Hyperthyroidism in which it is positively known that not more than the minimum amount of thyroid tissue is present, and in which the manifestations are predominantly of adreno-autonomic nature.

(Discussion Appears on Page 280)

Problems in the Diagnosis and Treatment of Goiter*

Martin Nordland, M.D.
Lawrence M. Larson, M.D.
Minneapolis

ONE of the simplest definitions of goiter states it to be a change in the size or the function of the thyroid gland, and from this definition a working classification of thyroid diseases may readily be made.

Changes in size or contour of the thyroid gland such as those which mechanically produce displacement or compression of the trachea, pressure on the recurrent laryngeal nerves or those resulting in substernal and intrathoracic projections of gland tissue, are as a rule readily diagnosed, and their treatment is just as readily indicated. In this type of case roentgenographic as well as laryngoscopic examinations are of considerable importance in the pre-operative management and in the surgical treatment of the disease. It has been estimated that in all instances in which the goiter has produced symptoms of mechanical nature that damage results to one or the other of the vocal cords in about five per cent of cases.

Thyroid diseases in which a change in the functional capacity of the gland has taken place are usually one or two types, and broadly speaking consist of either a diffuse or nodular enlargement. The former includes the exophthalmic and the latter the adenomatous goiter.

For this discussion a group of questions has been proposed which emphasize particularly some of the more common, as well as frequently confused problems in the diagnosis and treatment of thyroid disorders.

(1) *Can You Rely on the Metabolic Rate in the Study of Thyrotoxicosis?*

While the usually accepted range of normal variability is within plus or minus 10 per cent, too much stress in recent years has been placed upon this single observation. Its value in the diagnosis and treatment of thyroid disturbances is most important only when the reading is extremely high or extremely low. There are mild or atypical cases of exophthalmic goiter in which the basal metabolic rate falls within the range of plus 10 per cent to minus 10 per cent, or even below minus 10 per cent. There is also a group of cases of adenomatous goiter with hyperthyroidism, in which the readings are within these limits. In most of the cases in this group

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the readings are made following thyroidectomy, the normal level in these cases will be found to be generally between zero and minus 10 per cent or even below minus 10 per cent.

Boothby has pointed out that the basal metabolic rate of some normal persons lies well outside of the arbitrary limits of plus 10 per cent and minus 10 per cent and likewise according to a study by McKinlay of 155 young adults with good working capacity, 27.9 per cent had basal metabolic rates below normal.

Muscular inactivity, starvation, anemias, chronic illnesses, such as arthritides and so forth, may be associated with a secondary lowering of the basal metabolic rate. This may be contrasted to fevers, leukemia, polycythemia, acromegaly, and so forth, which produce a rise in the basal metabolic rate. In certain cases in which the goiter has become "burned out" the basal metabolic rate is not an indication as to the degree of thyrotoxicosis, and in many instances of this character serious cardiovascular changes may be present, even though the basal metabolic rate be normal.

(2) *How Can an Early or Mild Case of Thyrotoxicosis Be Differentiated from Neurasthenia or Psychoneurosis?*

This problem is not always easy to solve, but can best be accomplished by taking a careful history. In the neurasthenic or psychoneurotic we usually find an individual with a history of a long standing disorder. He is very self conscious, he complains of irregular palpitation of the heart, unnatural fears, particularly that of death. In a true thyrotoxicosis the patient is usually well up to the time of his present complaint, he has good morale, he is ambitious and he is not unnaturally afraid of an operation. Besides this, other symptoms and signs are usually present, such as tremor, increased pulse rate, increased tolerance to cold, excessive appetite in spite of weight loss, and so forth. The gland may or may not be enlarged, the pulse pressure is increased, the quadriceps group of muscles are weakened, bruits and eye signs are present, and the basal metabolic rate is elevated.

(3) *What Is the Length of Time of Preparation of the Toxic Goiter Case for Surgery?*

Unquestionably the patient who constitutes a

poor operative risk can be better prepared in the hospital, but the majority of goiter patients can be prepared outside of the hospital. Those patients with intense hyperthyroidism, especially if it is complicated by visceral changes, or diabetes, should be hospitalized. The average time for preparation for toxic cases is ten to fourteen days, but this may be increased in severe cases with visceral complications to two to five weeks. Those that do not improve in ten to fourteen days generally require a two stage operation. In many cases improvement may be judged by a daily check on the body weight. If there is a continual but steady loss of weight in spite of the administration of iodine it is a warning sign that even the smallest surgical procedures may be dangerous. At this point it should be emphasized that compound solution of iodine should be used only pre-operatively and post-operatively, and never without the understanding of the patient that he is to undergo surgery.

(4). *Does Prolonged Administration of Iodine Increase the Mortality Rate in the Surgery of the Toxic Goiter?*

In general this may be answered in the affirmative. Prolonged treatment has the same objection as the repeated use of roentgenotherapy. The surgical field becomes more iodized; thyroid tissue becomes more fragile and is rendered hard to handle and consequently the chances of post-operative hemorrhage are increased. This in turn increases the frequency of such surgical complications as nerve injury, infection and unsightly scars.

Because all goiter patients do not respond in the same manner to pre-operative treatment, it is important to consider:

(5) *What Place Has the Two Stage Operation in the Treatment of Goiter?*

A small number of patients with exophthalmic goiter apparently cannot be made safe surgical risks by the usual medical treatment. The basal metabolic rates in these cases are high and only slightly affected by the administration of iodine. Most of these patients present large firm goiters, usually of long standing, and frequently they are associated with degenerative visceral changes. Since only questionable benefit will be derived from any form of treatment other than resection, these patients must be accepted for operation as an increased risk. In such instances the two stage operation is clearly indicated. While it is admitted that preliminary ligation of the superior poles is very seldom necessary, nevertheless experience has taught that about 5 per cent of all toxic goiter patients have an idiosyncrasy to this drug. It is just as hazardous to do a complete

one stage operation upon this type of patient as it was in the days before the use of Lugol's solution, and therefore preliminary ligation of the superior poles together with rest in bed and sedatives for a period of two to four weeks will make excision of the gland at a later date a safe procedure. In cases in which the pulse becomes very rapid during the operation it is good judgment to discontinue the operation after the excision of one lobe and at a later date complete the thyroidectomy. It is also desirable to do a two stage operation in patients with large rapidly growing goiters, causing tracheal compression. In the hazardous surgical risk a simple ligation serves a very important function in that it is a barometer to the patient's tolerance for surgical interference.

(6) *How Would You Prevent Injury to the Parathyroids and What Would the Treatment Be Should Tetany Develop?*

Knowledge of thyroid surgery has improved to such an extent that post-operative tetany has become almost a rarity. However, disturbance of the circulation to the parathyroids no doubt is responsible for many mild cases. Involvement of the parathyroids in an inflammatory process, such as that following operative procedures, or accompanying trauma due to crushing one or more of these glands may result in a transient hypoparathyroidism. This has been likewise known to occur days after a severe blow on the neck.

The parathyroids in man are most commonly located two on each side of the trachea, situated at any level between the superior and the inferior pole on the postero internal surface of the thyroid. We have seen them on the anterior surface of the gland, particularly in the region of the distribution of the superior thyroid artery.

Tetany may be mild or severe and may come on at any time after operation on the thyroid gland. It usually appears within the first 24 hours, but may be delayed until months later. No danger need be apprehended unless the larynx is involved, in which case death often occurs from laryngeal spasm. The majority of post-operative tetany cases recover, although they are subject to recurrence.

The treatment of tetany consists in administering large doses of calcium by mouth, by proctoclysis or intravenously or by all three routes depending upon the urgency of the case. Favorable results have been reported with the use of intra-muscularly injected extract, such as that prepared by Hansen or Collip. Viosteral is useful in chronic cases of tetany to aid in the mobilization of calcium.

The remainder of the treatment is symptomatic. Sedatives and rest in bed are indicated. In women, conception should not be allowed to take place.

(7) *What is the Pre-operative and Post-operative Treatment When Cardiac Disability Is Present?*

In general any patient with a disabled heart and a nodular goiter should have a thyroidectomy. The duration of the thyrotoxicosis rather than its intensity is the most important factor in causing damage to the heart, so that the condition is seldom if ever found in young people. Where cardiac arrhythmia exists, an electrocardiographic determination should be made. The patient is put to bed and kept as quiet as possible. A high carbohydrate diet, very little meat and no coffee, tea, alcohol nor tobacco are given. Digitalis is used only when edema, myocardial insufficiency is present or where marked cardiac arrhythmia is detected. This treatment combined with the Lugol's solution of iodine will prepare the patient in from two to three weeks for operation. Digitalis is indicated post-operatively when fibrillation exists.

(8) *What Is the Treatment of Thyrotoxicosis Complicating Pregnancy?*

The state of pregnancy demands increased secretion of the thyroid gland. If the gland is normal and the supply of iodine in the body is adequate, this increase of thyroid will be sufficient.

The use of small doses of iodine is of value in the treatment of colloid goiter during pregnancy. Hypothyroidism may be treated satisfactorily by thyroid extract under careful observation. Adenomatous goiter, uncomplicated by hyperthyroidism, rarely needs treatment during pregnancy, although both adenomatous and colloid goiter may produce sufficient mechanical pressure to necessitate partial thyroidectomy.

Evidence indicates that hyperthyroidism resulting from adenomatous goiter is not satisfactorily controlled by iodine, and that it is safer to remove the adenomatous tissue if this condition is present. The use of compound solution of iodine in doses of 10 drops three times a day, in cases of exophthalmic goiter, should be followed by distinct improvement and definitely lowered basal metabolic rate within two weeks.

Except in certain cases in the later months of pregnancy, partial thyroidectomy should be performed without delay if the exophthalmic goiter does not show complete or nearly complete remission within two weeks after the institution of treatment with iodine; delay may be followed by irreparable injury to the viscera. There may be

exceptions to this rule in cases in which complicating conditions other than normal pregnancy exist. In cases of exophthalmic goiter and of adenomatous goiter with hyperthyroidism in which operation is or is not performed, the treatment is the same (plus the judicious use of iodine) as that usually given to women during pregnancy and confinement.

In cases of exophthalmic goiter complicated by pregnancy in which complete or almost complete remission occurs following the use of iodine, it may be deemed advisable to attempt to carry patients through pregnancy without resorting to surgical measures. In this event they should be closely observed, and the basal metabolic rate should be determined occasionally, as there is always danger of recurrence of the disease in spite of the continuous use of iodine. In general a safe rule to follow is to treat hyperthyroidism in pregnancy without regard to the pregnancy.

(9) *How May a Satisfactory Scar Be Obtained?*

First of all the incision must be straight and clean so that accurate approximation of the wound margins may be made. This should be carried through the fascia as well as through the skin, down to the prethyroid muscles. Secondly, all drainage tubes, skin clips and sutures should be removed within 48 hours so that pressure necrosis or infection of stitches with its resultant increased amount of scar tissue does not occur. Careful approximation of the fascias as well as substantial subcuticular stitch is a necessity in aiding the skin margins to fall together so that all tension on suture lines may be avoided.

(10) *What Are the Chances of Post-operative Recurrence of Thyrotoxicosis?*

In exophthalmic goiter the incidence of recurrence of hyperthyroidism has been estimated as varying from three to six per cent, and in the majority of cases this recurrence is not due to inadequate or faulty surgery. The amount of gland to be removed in individual cases varies with the judgment of the surgeon. As a rule only a thin layer of thyroid tissue on the posterior capsule should be preserved. In a few cases this small amount is capable of regeneration to the extent of causing hyperthyroidism, and this fact seems to explain most cases of this character.

The therapy of recurrent thyrotoxicosis is a difficult problem. Further resection of the gland in some is of no avail, but in most of these cases it proves to be curative. In many individuals with only mild symptoms no treatment is necessary.

Tissue Culture*

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ALTHOUGH the first successful tissue culture was reported less than twenty-five years ago there is now a voluminous literature on the subject. The rapid increase in the number of articles reporting studies made by this technique may be illustrated by citing the fact that the bibliography in first edition (1925) of Fischer's "Tissue Culture" lists 541 titles while the second edition (1927) contains over 1200 citations and the 1930 edition contains about 1800.

There is scarcely a branch of the biological sciences in which this technique has not proved useful. Hence the literature in many fields contains references the adequate understanding of which depends on a knowledge of at least the fundamental principles involved in the procedures commonly employed. It is the object of this writing to outline the historical aspects of the development of the technique and, in an extremely concise form, to describe the technical procedure. Comment is then made on the characteristics of simple cultures and then some of the problems the solution of which has been especially hastened by tissue cultures studies will be considered.

Tissue culture is defined as the continued growth of a tissue outside the organism. It is so defined in order to distinguish between those preparations in which cells or tissues survive only temporarily and real cultures (in the sense used by the bacteriologist) in which growth is a continuous process over long periods of time or indefinitely.

Although the science is relatively young, the idea of making such preparations is probably quite old and doubtless suggested by the procedures of the bacteriologist.

That it would be more difficult to culture a tissue than the single celled organisms usually grown in bacteriology must have been foreseen. To understand the reason for this, one needs only to recall that the simple protoplasm of the unicellular organism carries on the fundamental physiological functions without specialization while a tissue from a complex organism, in

acquiring special abilities in certain directions, has become quite dependent on the other tissues in the organism of which it is a part. That undifferentiated tissue grows more readily than the specialized types is obvious from the well known fact that when a mixture of the two (i. e. and organ) is planted, it is the non-differentiated connective tissue background that grows while the specialized cell type is usually overgrown and shortly disappears. The result is a culture in which the dominant cell is from the connective tissue. Thus a common source of material for starting a culture of fibroblasts is embryonic chick heart.

It was more than a mere academic interest that prompted the attempt to grow tissues outside the organism; it was the desire to get away from the complex and uncontrollable conditions inevitable when using the intact animal. One may profitably contrast the conditions that prevail in an experimental inflammatory reaction in the animal and in the culture; in the animal new cells are constantly arriving from both the blood stream and the surrounding tissues while in the culture there is no uncontrollable source of cells to complicate the results. The simplicity of the culture has made it possible to settle certain controverted points in cellular relationships much more convincingly than had been possible in animal experiments.

In 1897 Loeb¹ claimed to have grown certain cells outside the organism. No details were published.

In 1907 Ross Harrison² published a preliminary note on the growth of cells in vitro. He reported complete details three years later.³ His interest was in the mode of growth of the neurofibril. He had cut segments from the neural cord of amphibian larvae and later studied the manner in which the fibrils progressed into the clot which filled the space left by removal of the segment. He then sought to duplicate the results outside the organism. He placed fragments of the neural tissue in unclotted lymph from the dorsal lymph sac of the frog; after clotting had taken place he sealed the culture in a hollow ground slide and incubated it. The result was the first successful tissue culture.

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The next advance in technique was made when Burrows⁴ used plasma instead of lymph as a source of fibrin clot. The advantage in plasma lies in the fact that it is available in quantity and is more constant in quality than is lymph.

The next improvement came with the introduction by Carrel^{5, 6} of tissue extract which served as a source of food for the growing cells. (It also caused the plasma to clot very promptly).

In 1926 Cracium^{7, 8} introduced heparin as an anti-coagulant suitable for tissue culture work. Up to that time no really satisfactory anti-coagulant had been available for keeping plasma unclotted. The usual anti-coagulants being unphysiological (hirudin possible exception?), resort was had to such measures as care in drawing blood in order to avoid contact with injured tissue, using paraffin or oil on glass surfaces, keeping all apparatus ice cold, etc. These rigid precautions were very time consuming. Although the methods were fairly satisfactory in the case of slowly clotting avian plasma, it was hardly possible to keep the rapidly clotting mammalian plasma fluid for extensive periods by such means.

The use of heparin has largely overcome these difficulties. It fell short of being ideal in that if sufficient amount of the anti-coagulant were used to keep the plasma fluid for extensive periods, trouble was sometimes experienced in causing the plasma to clot by the addition of tissue extract. The introduction of a more powerful and more stable extract has overcome this difficulty (Author 1931).⁹

The fundamental technical advances have been the growth of the first culture, the substitution of plasma for lymph, the use of tissue extract as a source of food and the use of heparin as anti-coagulant. No attempt will here be made to cover the minor refinements which have come into use.

Until recently the technical difficulties were such that this type of work was carried on for the most part only in institutions provided with special facilities. As will be noted below, the technique is valuable alike to the pathologist, the physiologist, the biologist, the biological chemist, the experimental anatomist, etc. Obviously if we were to adhere to the idea that extensive physical facilities and numerous well trained assistants are necessary for this type of work, we would limit its usefulness to an unjustifiable extent. During the last few years it has been demonstrated that it is possible to greatly simplify certain of the procedures involved,

especially the preparation of the sterile media (Author 1930).¹⁰

In the same paper there is also described a satisfactory paraffin method for serial sections of cultures. An effort has been made to avoid expensive and complicated equipment. And in no single instance is an assistant required to carry out any procedure involved either in preparation of media or management of the cultures.

TECHNIQUE

The first cultures were grown by Harrison in a moist chamber. The tissue fragment was simply immersed in a drop of unclotted lymph on a cover slip and after clotting had taken place the cover was inverted over a hollow ground slide and sealed to prevent evaporation. This type of preparation is still widely used. Maximow introduced the practice of planting the culture on a small cover which is then attached to a larger one by a drop of fluid, the preparation then being inverted and sealed as before. The advantage gained is that the culture may be repeatedly opened for washing and feeding with little danger of contamination since the small cover bearing the culture can be removed from the larger cover without bringing the former near the contaminated edge of the latter. The culture is then washed by immersing in a sterile saline, refed and sealed in a new moist chamber. Feeding is accomplished by adding a drop or two of a mixture of plasma and tissue extract. As pointed out earlier, Burrows substituted plasma for the lymph used by Harrison.

In 1923, Carrel¹¹ announced a technique in which the cultures were grown in flasks. Here the culture is planted in the usual clot (plasma-tissue extract), the nutrient medium being fluid tissue extract which is poured over the clot and changed at intervals as required.

Observations are made on both the living and fixed material. Measurement of the growth rate of the culture has been widely used as an index of the physiological activity. Wide variations in growth rate necessitate the most careful control.¹²

The general microscopic appearance of the edge of the culture can be correlated rather closely with the growth rate as noted below.

Recently notable success has been attained by Canti and others in making motion pictures of cultures of normal and malignant tissues. The most minute details of the living cells are well shown. Mitochondria, fat globules, the details of nuclear division, the essential characteristics of fibroblasts and macrophages, as well as the activity of some types of malignant cells are

here depicted with remarkable clarity. The film by Canti and a more recent one by Lewis can be had from the American Society for the Control of Cancer, New York City. These are available in either the 16 mm. or 35 mm. size, the only expense being transportation. The dark field section of the Canti film makes a remarkably beautiful demonstration.

Maximow strongly emphasized the necessity of stained sections. He pointed out that observation on living cultures is usually limited to the edge where the growth is thin. The same is true of the preparation fixed and stained in toto. Usually serial sections are made since the total mass of the growth is small and particularly since relationships are more reliably shown in serial sections. Once the technical difficulties due to the peculiar physical characteristics of the culture are overcome, the tissue sections may be stained with any of the usual staining methods.

At present there is a rather general feeling that the microrespirometer will prove a valuable device in approaching a large number of physiological problems. Warburg's studies on the metabolism of normal and malignant tissues focused attention on this method. Study of the gaseous exchanges in animals has for many years been a very profitable method, so it is natural that what is essentially the same procedure in a micro form should have wide appeal.

GENERAL APPEARANCE OF TYPICAL CULTURES

In the successful preparation the time at which the first growth is noted depends on the age of the tissue planted; in general the younger the tissue the more quickly it starts to grow. Thus embryonic tissues start earlier than adult types and even within the embryonic period it has been shown that the same rule holds, i. e. the latent period is shorter in tissue from younger embryos. Cultures from the mesenteric node of the adult rabbit may show no fibroblastic growth before the eighth day; cultures of heart from the chick embryo frequently show fibroblasts in three hours.

In the typical culture the fibroblasts grow radially, the limits of the growth eventually approximating a circle (even though the fragment planted be irregular). The individual cells are spindle shaped while growing rapidly. When the conditions become unfavorable, resulting in a slowing of the growth for any reason the cells become larger and tend to become stellate rather than spindle shaped; and there is usually a progressive accumulation of fatty granules as the cell loses its vitality. The completely

devalitized cell has usually retracted its processes becoming practically round.

If one plots the increase in area of such a culture there is found a close correlation between the slowing of the growth of the culture and the qualitative changes noted above. Thus the practiced eye can predict the slant of the growth curve at any time by examination of the periphery of the culture.

It should be pointed out that the growth of such a fibroblast culture does not continue indefinitely without transplantation. There comes a time when growth stops (even though well cared for as far as feeding is concerned). Small pieces excised from such a "stopped" culture will grow in a normal fashion when suitably planted in a new clot. No explanation of this phenomenon is offered.

A culture of leucocytes presents many sharp contrasts as compared with fibroblasts. The leucocyte in culture exists as an isolated unit as it does in the body whereas the fibroblasts are closely associated (and probably form a syncytium?). Cultures of leucocytes planted close together show no tendency to fuse (in contrast to fibroblasts). Then, too, there is the characteristic separation of the various groups of cells as they progress outward; this is due to the different rates at which the various cell types move, the P. M. N. moving more rapidly than the lymphoid types. The concentric rings which are prominent around early cultures are an expression of the above behavior.

No safe generalization can be made in regard to the appearance of cultures of special tissue types. Indeed, it is not always possible to be certain of the classification of a particular cell. We know that the physical and chemical environment strongly influence the anatomical characteristics of a cell at any given moment. We are not permitted to assume that because a cell presents a certain picture in its natural position in the animal it will have the same appearance in the entirely new environment of the tissue culture.

FUNDAMENTAL PHYSICAL AND CHEMICAL REQUIREMENTS

It may be stated that in general cells grow only at interfaces, i. e., at junctions of fluid and solid. Where saline alone is used cells are seen to grow at the fluid-glass interface. In such systems there is very little real growth; the cells are for most part in a condition of survival. The chief advantage of this type of preparation is that it permits very satisfactory conditions for observations of cells for short

periods during which amoeboid movement and various details of structure may be noted. It has been used with very good results by M. R. and W. H. Lewis and others.

The most satisfactory conditions for growth are offered by the fibrin clot. Many other substances such as silk, cobwebs, pith, cotton, glass wool, etc., have been tried by various observers but none has been found satisfactory. That the clot owes its superiority to the physical structure of the fibrin rather than any chemical constituent of the plasma is shown by the fact that it provides the proper conditions for growth even after formalin fixation (and suitable washing).¹³

From a physical standpoint a fibrin clot with its contained fluid constitutes a remarkable system. The protein, fibrinogen, from which fibrin is formed is present in blood in only small amounts, i. e., 0.5% or less. Nevertheless, this is sufficient to bind the cells and fluid of the blood into a jelly like mass. Plasma diluted 12 to 25 times still clots firmly enough to prevent spilling from a tube. Here is a gel in which over 99% of fluid is held by less than one per cent of solid. Microscopic studies of clots have shown that the fibrin is present in the form of fine fibrils. It is this state of extremely fine division that constitutes the physical peculiarity of the clot and enables such a small amount of solid to bind such a large amount of fluid. As a mass is more and more finely divided the surface exposed increases rapidly while the mass remains unchanged. And since interface is a function of surface, it is easily seen that the fibrin clot offers a minimum of solid (which impedes cell growth) and a maximum of interface (which promotes cell growth).

An attempt to explain why it is that the cells find these interfaces the optimum conditions for growth would lead only to speculation. However, it is known that the conditions at such interfaces differ markedly in certain respects from those prevailing elsewhere in the system. The electric charge and the surface tension are probably peculiar; and certain classes of substances are concentrated here.

That growth will not take place unless the clot is intact at the periphery of the culture is obvious to anyone who has worked with these preparations; and certain practical problems arise from this fact. Whenever there is lysis or mechanical breaking of the clot at a point on the periphery, growth ceases at that point; if the whole periphery is involved, the culture is lost unless the clot can be repaired with fresh

fibrin. This is not often successful since the subsequent growth is apt to be uneven at best and such preparations yield unreliable data in a quantitative sense. If the culture is being used for some purpose which does not necessitate measurement, the disadvantage may not be so great.

Malignant cells have long been known frequently to lyse the clot and until Fisher¹⁴ developed a special method for growing such cells rather little success was had in propagating them.

The discussion of the influence which the size of tissue fragment exercises on the subsequent behavior will be limited to the fact that there is a certain minimum mass required in order to obtain growth. Single cells will not proliferate, even though they be uninjured as judged by ordinary observation. It is not possible to state just how many cells are required for growth but practically one finds that beyond certain limits the smaller the fragments planted the greater the number of failures, other factors being equal. One of the practical problems arising from this fact is that one cannot obtain pure cultures by starting with a single cell. That at least certain malignant cells constitute an exception to the above generalization will be brought out under the proper heading.

The early studies on the influence of osmotic pressure led to the conclusion that slightly hypotonic media were more effective in stimulating growth than isotonic or hypertonic media. These early studies were made by Carrel. It was later found by workers of this same group that the greater effectiveness of hypotonic media was only apparent; there was a more rapid initial migration but not a greater increase in mass. The general conception at present is that the isotonic medium offers the optimum conditions for growth. Maximow regularly added distilled water to his media, thereby rendering it hypotonic but it should be noted that the technique of preparing slide cultures permits evaporation (variable according to the conditions) and this factor would render an isotonic medium hypertonic. It is probable that the added water compensated this loss.

The effect of hydrogen ion concentration has been extensively studied by the Carrel group¹³ and Lewis and Felton.¹⁵ Felton¹⁶ has developed a colorimetric method suitable for determinations on culture media. In general it has been found that the optimum growth occurs slightly to the alkaline side of neutrality, the curves falling off rather rapidly with increase of either alkalinity or acidity. It should be noted, however, that the

vital activity of a culture continues far beyond the range that can be tolerated by the intact organism. Of course in the organism what is called death is merely the cessation of some vital function, i. e., collapse of circulation or respiration, the real somatic death occurring at some variable later time.

In discussing the nutritive requirements of cells, the general statement may be made that no synthetic medium has sufficed to promote cell growth indefinitely. All cells except lymphoid types require tissue extract; these lymphoid types are assumed to proliferate on the substances in plasma or serum. Tissue extract may be an extract of the whole organism or of some organ. In either case it is complex to an extreme degree and certainly cannot be regarded as a medium of known composition. The same should probably be said regarding the composition of plasma or serum, although much more is known regarding the chemistry of these than is the case with tissue extract.

The great mass of the studies on the chemical requirements of growing cells have been done by Carrel and his collaborators. However, very little can be said with certainty in regard to the nature of the substances necessary for cell growth.

It has happened that conclusions of fundamental significance have been arrived at only to be greatly modified later. In the interest of conservatism one may do well to consider only facts of some years standing. Limiting the material in this manner, one may safely conclude that the substances (or conditions or both) existing in a tissue extract which promote cell proliferation are very labile; they change spontaneously as a function of time; they are diminished by incubation for some hours at 37.5° C. and entirely suppressed by incubation at 56° C. for one hour; the activity is decreased by shaking. The active substances will not pass through a Berkfeld filter.

Attempts to isolate the active substances, have not been successful, though much valuable information has been derived from such efforts. Precipitation experiments have shown that the active fraction comes down with the globulins. In general the active substances are either protein in nature or closely associated with protein. In view of the fact that many substances are strongly absorbed on proteins the technical difficulties encountered here are many. The possibility that vitamins, hormones and enzymes present influence the behavior of the culture in ways as yet unknown must not be overlooked.

It is understood that sterility is an absolute requirement. All media that cannot be sterilized must be kept sterile as prepared. The ordinary accidental contaminations very quickly destroy a culture.

DISCUSSION

The techniques described have been found useful in approaching many experimental problems. It should be pointed out, however, that there is a fundamental difference between the culture as used by Carrel and as used by Maximow. Carrel and his collaborators have usually so managed the culture that the cells quickly attained a maximum proliferative activity. Measurement of the increase in area of growth has been the criterion used in judging whether an experimental medium or condition was more or less suitable than a control. A culture so used is a biological indicator; its relative growth rate as compared with a control reveals whether the conditions prevailing are more or less favorable for maintaining that particular cell type at the rapid proliferative rate characteristic of this type of culture. In the hands of Carrel and his collaborators and many independent workers this type of culture has been found extremely useful as an approach to many problems of fundamental importance.

It appears that Maximow felt that suppression of the extremely rapid cell division, which characterized the culture as used by Carrel, might permit cells to attain a physiological equilibrium in which their natural tendencies (as seen in the animal) would be more apt to manifest themselves. To this end he avoided the frequent transplantation and kept the cells in the same clot for long periods; instead of growing rapidly the cells remained in a more static condition. It was in such cultures of thymic tissue that he first noted fiber formation. This work followed up by Bloom and his students has established that fibers are readily formed in cultures.

Hence under certain culture conditions a cell type is found to exhibit the same physiological function *in vivo* and *in vitro*. Other evidences that this is true will be noted below.

Tissue cultures have been found very useful in studying many problems concerned with intercellular relationships. The simpler conditions prevailing in the cultures have made it possible to obtain more convincing evidence than that afforded by animal experiments. Such problems are complicated in animals by the fact that it is not possible to eliminate the cells arriving via the circulation and from the surrounding tissue. In cultures such extraneous sources of cells are avoided.

In leucocyte cultures prepared from the buffy coat of centrifuged blood it is possible to follow the various cell types and to determine what, if any, transformations take place. It is agreed that the specialized leucocytes, i. e., the granulocytes, die rather soon in cultures. These cells migrate rapidly after planting but even in the first 24 hours many of them die and rarely do they retain their vitality beyond three to four days. The non-granular cells, i. e., the lymphocytes and monocytes (the old transitionals) show a number of interesting transformations. The monocytes soon become very phagocytic. They may be seen containing debris of all sorts, red cells, dead granulocytes, etc. They attain the size and general characteristics of the large ameboid phagocytes of the tissue spaces which are usually called macrophages. The lymphocytes increase in size and follow the same developmental direction. Very small lymphocytes may die quite early.

It is quite generally accepted that these transformed blood leucocytes may turn into cells which are fibroblasts or resemble them very closely. Indeed, it has been found by Maximow and more recently confirmed by Bloom that they may form fibers in the cultures.

This tendency of the non-granular blood cells to transform into large phagocytic types and even into fibroblasts, as seen in cultures, fits in very nicely with animal experimental work on septic and aseptic inflammatory processes. In most such processes there is early a great outpouring of blood leucocytes into the area involved. The granulocytes show the same limited life span in the inflammatory field as seen in cultures. The non-granular cells show the same tendency to grow, acquire phagocytic properties and eventually to contribute to the formation of fibroblasts and subsequently to the formation of scar tissue.

What is perhaps the dominant theory at present assumes that in general the exudate cell in inflammation comes from two sources, namely, the blood stream and the local tissue. Most workers feel that for the majority of inflammatory processes the blood stream is the main source of exudate cells. There are some (the von Mollendorfs) who feel that the exudate cell may be derived mainly from the local tissue, i. e., the fibroblasts. Very little evidence can be found to support this contention. Of course, it is generally agreed that the local tissue always contains some active and potential phagocytes (the "wandering" and "resting wandering" cells of Maximow). In 1931, Bloom¹⁷ discussed this question. He admits the possibility that fibroblasts in an inflammatory field might give rise to ameboid phagocytic cells but gives excellent reasons for doubting that this is

an important source of exudate cells. It should be mentioned, however, that there are competent cytologists who are coming to believe that in certain cases the fibroblastic system may be an important source of ameboid, phagocytic cells. The point must be regarded as unsettled.

It has been possible also to follow the cellular transformations which give rise to such cells as the epitheloid and giant cells found in tuberculous lesions. Maximow's article on tuberculosis in tissue cultures published in the *Journal of Infectious Diseases*, 1924, is beautifully illustrated in color and is well worth reading. This article is considered of special importance for a number of reasons. The fact that the tissue and the tubercle bacillus grow so well together is in itself remarkable. All types of cells appear to survive in the presence of the organism. Fibroblasts are seen to grow literally covered with great masses of the bacilli; phagocytic types may contain countless numbers of the organism and show no anatomical evidence of damage.

It would seem reasonable to suppose that such a culture with organism and tissue growing together over long periods would be the ideal preparation for testing substances in the search for a specific.

The similarity between the histological formations seen in cultures infected with the tubercle bacillus and the specific lesions seen in the animal is striking. The presence of the epitheloid and giant cells in typical formation permits one to state that an anatomical tubercle forms in the culture. This fact is one of the most important pieces of evidence bearing on the question of the identity or similarity of the physiological processes in vivo and in vitro. In this instance it is permissible to conclude that the result is identical in all essential respects.

Warburg's researches¹⁸ on the metabolism of malignant tissues in vitro have greatly stimulated interest in malignancy in general and especially in tissue culture studies along this line. Warburg's preparations were not tissue cultures in the sense defined at the beginning of this paper. Slices of tumor tissue were studied in microrespirometers, the oxygen consumption and carbon dioxide output giving a clue to certain phases of the metabolism.

One result of these researches was to show that there was no essential similarity between the metabolism of such tissue and embryonic tissue. It is a well known fact that in such tumors, especially when growing rapidly, there are many cells undergoing mitosis; this is true also of embryonic tissue as well as of cultures of embryonic tissue or adult tissue which has grown in culture

long enough to assume the rapid growth rate characteristic of such preparations. The similarity in the histological picture in this respect is probably not significant.

A great many studies have been done on various malignant tissue using culture methods. One of the great difficulties in using the method has been the fact that such cells frequently lyse the clot. When this happens growth ceases as in cultures of other types. Fischer described a technique intended to obviate this difficulty. He used muscle fragments excised under sterile conditions and kept on ice long enough to kill the tissue; these he incorporated in the clot close to the tumor tissue. The growing tissue infiltrated the dead muscle in much the same way it would in the animal. Eventually the muscle fragment was destroyed; it could then be replaced with a fresh fragment. In this way it was possible to keep such tissue growing for extensive periods.

Here again it may be noted that the process of infiltration and eventual destruction of the muscle fragment in the culture follows much the same line and presents histological pictures very similar to those seen in the animal.

No attempt will be made to consider in detail the many excellent researches on malignancy done with cultures. It may be stated, however, that the malignant cell has been shown to possess one property not found in normal cells, namely, that it can exist and divide as an isolated unit. Normal cells are unable to do this. It is not possible to say at this time what the significance of this fact may be. It is known also that at least certain types of malignant cells may retain their biological characteristics through long periods of life in vitro.

One sometimes hears the idea expressed that it should be possible to induce malignant changes in cultures since cultures of tissue may be kept alive beyond the normal life span of the animal from which they were derived. Such an idea is not well based since it fails to take account of the fact that age and senility are not properties of a tissue culture. Tissue growing in culture is immortal in a sense not found to be the case in any complex organism; the culture is an ageless thing; while properly cared for and divided at intervals it seems to maintain a practically constant growth rate.

Tissue culture may eventually prove an important technique in making fundamental advance in the field of malignancy; a more optimistic statement is not justifiable at this time.

Those studying filterable viruses have utilized tissue culture methods to a considerable extent.

It was known that virus survived in vitro in association with cells rather than body fluids and that these cells must be alive (either actually proliferating or surviving) to support the virus.

Many different types of virus have been found to survive or increase in the cultures. In some instances the increase in amount of virus has been striking—for instance, cultures of testicle inoculated with vaccine virus yielded 51,000 times as much in the eleventh generation as was found in the first cultures. In other experiments the Rous virus was found to increase from 250 to 100,000 units in eight days in cultures of pulped embryo.

In general it should be noted that there is a rather widespread tendency to assume that, since it is possible to grow cells outside the body indefinitely, it should be possible to solve quite easily almost any physiological or pathological problem. Nothing could be further from the truth. It is very easy to make cultures grow but in general it is no easier to plan crucial experiments and interpret results in this field than in the field of animal experimentation (certain exceptions noted above).

The physiological functions of a cell or tissue which are expressed anatomically (such as fiber formation or tubercle formation, etc) are more easily interpreted than those otherwise expressed. In many instances the interpretation depends on elaboration of suitable chemical techniques.

It should be borne in mind that tissue culture, like all other experimental techniques, has its advantages—great in some instances and not so pronounced in others—but it also has its limitations.

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RIGHT OF CORPORATIONS TO PRACTICE MEDICINE QUESTIONED

It is not to be wondered at that corporations should endeavor to invade the field of medical practice. Their right to do so, however, has been questioned in courts in different parts of our land and, so far, judicial decisions have not appeared to be in their favor.

Attorney General Harry H. Peterson of Minnesota, in the belief that a corporation, under the law, is not permitted to engage in the practice of medicine and healing, is pressing *quo warranto* proceedings against the recently incorporated Pioneer Mutual Health and Benefit Insurance Company in Ramsey County District Court.

In scrapping any structure for a new abode, there is always some household god we are indisposed to leave behind. The sacredness of the individual relationship between physician and patient is something that even the medical-care-cost committee does not wish to discard.

If corporations are conceded the right to practice medicine, we shall soon expect to see medical robots at every cross roads filling station, where members of the family may deposit coins in a slot and have a diagnosis or treatment while the car is being greased.

A. E. H.

"SEE YOUR DOCTOR" IS THE BETTER ADVICE

It is time that something should be said about disappointments occasionally heard concerning "the periodic physical examination."

When it was first advocated on a large scale, social workers co-operated eagerly, but it was in that mechanical way so characteristic of organization work. We are afraid that if they enlarged upon the subject, at all, it was to suggest the extreme things that might be expected from such an examination. The result was that on return to compare notes, there was disappointment in finding that all the mechanics of diagnosis had not been carried to the nth degree and the profession, in turn, was told that it was indifferent to the needs of the public and apparently unprepared to meet the demands for such examinations. Nothing could be further from the facts, but such is the penalty imposed by a machine-crazed age of cog-wheel-clicking and mass production. The medical profession knows that there must be individualization. Some should "go through the machine" and some should be spared from being "put through." Not until the physician has been consulted can this be determined. The desire to usurp the functions of the physician seems to be an inborn trait of the human

heart. It is prompted by kindness, which makes it all the more difficult to control. No one, however, has any business to say what procedure the doctor shall carry out in any examination beyond certain fundamentals, and neither party benefits by any such insistence.

Everyone should be advised to visit their physician with periodic regularity but whether or not they should be put through the hopper regardless, is only for him to say. A presumably healthy individual should not be led to believe that an examination is incomplete if it does not include a urea-nitrogen, sugar-tolerance and metabolism test. Neither should he be told that it is incomplete unless a certain number of hours is consumed. He should be told to *see his doctor* for such examination and check-up as may appear advisable under the circumstances. If we must have slogans, they should be clear and understandable, and it is up to the profession to work toward that goal.

A. E. H.

CARDIAC NURSING

The Cardiac Nursing Service of the Visiting Nurses Association of Minneapolis has now been in operation for a period of two and a half years. It was instituted neither as a novelty nor an experiment, for cardiac nursing has been and always will be one of the regular duties of visiting nurses but it has long been felt that with the increasing number of these cases a problem presented itself which could be best met by specialized provision, furnishing trained, systematic observation and care of cardiac patients who are under competent medical treatment, especially for those who are exhibiting symptoms of decompensation or fibrillation and are under the type of treatment which requires careful checking and much more observation than the physician can possibly give. This has reference, of course, to the patients who for various reasons are not hospitalized or those who have been hospitalized and have reached a point where they can become out-patients.

At present one nurse is so engaged. In addition to routine hospital training prior to graduation and ten years experience in general nursing, both private duty and public health, she was given intensive training in the recognition of cardiac symptoms and as the amount of work increases other nurses are assigned to her for the purposes of becoming

familiar with the requirements and technique of this branch. As far as possible this work is done on a standardized basis. For instance, all blood pressure observations are made in accordance with the standard methods of reading laid down by Dr. George Fahr and the same terminology is used throughout.

The work was begun in Minneapolis in October, 1930. The total number of patients carried on this service in 1931 was 238; in 1932, 307.

It is self evident that this specialized visiting service is bound to become increasingly useful alike to patients and physicians in this especially difficult class of patients, most of whom are poor people, if not actually indigent. The patient has the advantage of economic relief and adequate care while the physician, who is at all times in full control of the situation, knows what is going on and that his orders are being competently carried out without the necessary time consumption and physical wear and tear of frequent personal contact.

G. C.

PHYSICIANS LEAD IN ADULT EDUCATION

Adult education has received much popular comment during the past few years. It has been pointed out that because of the rapidly changing relationships of the nations of the world economically, politically, culturally and industrially, it is necessary that the pursuit of education be not left to the youth of the land alone, but continued throughout active life in every community having the welfare of its citizens at heart. It is a civic duty to afford education to all subjects of government regardless of their age, not only for their individual but collective good. Enlightenment is a talisman that guards against bigotry, social unrest, corruption and disease. The safety of any nation is proportionate to the degree of enlightenment, not only of the ruling but ruled class, which, in our case, should be the same. It insures strength, security and happiness.

Not to belittle but rather to show our emphatic approval of this movement, we would call attention to the medical profession's attitude of leadership along this line. It has recognized the need of adult education in a twofold sense; for its own members, and for the general public. It has banded itself

together for scientific discussions and mutual dissemination of knowledge, and to the public it has always been ready to give warning and advice how best to avoid sickness with its attendant suffering even though such advice

deprived it of the remuneration that might otherwise come.

We are and always have been in favor of adult education and intellectual growth.

A. E. H.

Proceedings Minneapolis Clinical Club

Meeting, March 9, 1933.

The regular monthly meeting of the Minneapolis Clinical Club was held on Thursday evening, March 9, 1933, in the Lounge of the Hennepin County Medical Society, with Vice-President Erling W. Hansen presiding.

Following a brief business meeting the following scientific program was presented:

INAUGURAL DISSERTATION

THE DIFFERENTIATION OF LUMBO-SACRAL STRAIN, SACRO-ILIAC STRAIN AND SCIATIC NEURITIS HARVEY NELSON, M. D.

SUMMARY

This paper was given for the purpose of differentiating the diagnosis of lumbo-sacral strain, sacro-iliac strain and sciatic neuritis, with the particular purpose of being a practical review of a subject about which a hazy uncertainty has developed in the past. The anatomy of the lumbo-sacral and sacro-iliac regions, as well as the sciatic nerve, was reviewed.

In the differentiation of the lumbo-sacral and sacro-iliac strains, emphasis was made upon the obtaining of an accurate history and the performance of a detailed and accurate examination. The routine examination employed by Smith-Peterson was described and used as a basic example of a thorough examination of the back. The significance of the location of pain in certain detailed areas was indicated and the importance and interpretation of such tests as the straight leg raising, knee rocking, Gaenslen, and the iliac compression test were described.

In the differentiation of sciatic neuritis from lumbo-sacral and sacro-iliac strains the various general types of neuritis were outlined, and the differential symptoms described.

CONCLUSION

In conclusion, I believe that there has been a definite tendency for the medical profession as a whole to confuse lumbo-sacral strains, sacro-iliac strains and sciatic neuritis in the past, and that a large amount of this confusion has arisen as much out of insufficient examination of the area as an improper evaluation of the symptoms found. In the majority of cases, such a simple procedure as definitely localizing the area in which the pain is found is sufficient to at least indicate the type of condition which might be present. It is the

experience of men who have observed large numbers of back injuries that actual sacro-iliac strain is a very infrequent condition. It is unfortunate that the medical profession in this regard has subjected itself to ridicule by the legal fraternity and laity merely through improper observation, and might I say, insufficient examination.

DISCUSSION

DR. E. T. EVANS: One reason I am very interested in this paper is because I am glad to hear the general surgeons admitting that sacro-iliac strains are rare. Some years ago when I first came to Minneapolis Dr. Webb informed me that within a short time of his taking over the work of the Great Northern the diagnosis of sacro-iliac strain became very rare. This was due to his insistence upon a careful and complete examination and interpretation of all back injuries.

The point that impressed me most in this paper is the careful differentiation that Dr. Nelson has given between lumbo-sacral and sacro-iliac lesions. I only wish he had stressed more the findings of lumbo-sacral as contradistinctive to the sacro-iliac findings. A good many of the signs depended upon by Smith-Peterson could be interpreted as lumbo-sacral signs, and I think the general viewpoint is swinging toward that interpretation. I know that is Dr. Nelson's viewpoint. One of the factors on which I have placed a good deal of stress is the interpretation of radiation of pain. Pain over the lateral aspect of the thigh, along the course of the lateral femoral artery nerve immediately places the lesion in the lumbar area because of the higher origin of the nerve roots.

The practice has been to say that one does not get a sciatic syndrome in lumbo-sacral lesions and that sciatica indicates a sacro-iliac lesion. This is not the case. One does get the sciatic syndrome in lumbo-sacral lesions, especially in those associated with low grade peri-articular arthritis, and one thing I would like to have stressed more is the relationship of low grade infection in the causation of that pain. I think a good many of our cases of back strains are not strains in the ordinary sense, but rather a flare-up or calling to one's attention an arthritis which has been present and involuntarily protected; and only an excessive inadvertent movement has brought it to the attention of the patient with the localization and radiation of pain so commonly found. In other words, similar to a partially stiff joint else-

where which has suddenly moved beyond the range of motion of which it is normally capable.

DR. R. C. WEBB: I think this paper is most timely and most appropriate, and I think that Dr. Nelson should be congratulated on it, especially the very thorough and understandable manner in which he has presented it.

It is unfortunately true that the lack of knowledge on this subject has brought the profession into considerable ridicule, and it is embarrassing to have to disagree with someone who claims that a patient has a sacro-iliac strain or something else when it is obvious from their method of presentation that they simply do not know how to examine backs.

We were very carefully taught how to examine hearts, lungs, urinary tracts, central nervous systems, et cetera, but our education has been neglected with respect to the back, and it is probably the reason that irregulars are so successful. I think it would be well for the profession to attempt to correct the situation, and there is no better group than this group to carry his work on in this community because the students do graduate without this training, and do not know the difference between sacro-iliac strains and other back injuries, and call them all sacro-iliac to start with.

I took one hundred consecutive cases of back injuries and got the superintendent of the Great Northern Railroad to give me the time actually lost in these back injuries in otherwise healthy railroad men, and it was very interesting. They seem to fall into two definite classes: those who hurt their backs while undergoing some effort, such as lifting (one common way is when a man is lifting something heavy and the other man lets go, leaving all the strain on the one man) and the other group in which a man is thrown, hurled or twisted in some way.

These one hundred cases averaged sixteen days off duty and those who injured their backs lifting averaged eleven days off duty. Those who were hurled, thrown or twisted averaged twenty-one days off duty. It seems to me those figures are particularly interesting to a group such as this, because when we see a person with a pain in the back we are very much inclined to go and testify that we have not the slightest idea when this patient will ever get well, and it is quite possible he will never get well.

In order to assist in the examination of backs along the entire railroad system I endeavored to make up a form for the examination of the back. This form has been published in full in Dr. Frederick Christophher's book on "Minor Surgery." While Dr. Nelson was reading his paper tonight I was thinking how valuable it would be if somebody could endow him so that he could put his paper into the form of a movie and illustrate his various points with illustrations of the patient being carried through each test.

There is one point which I want to stress; that is, the importance of the prostate gland. I do not think the prostatic infection has been stressed sufficiently as a cause of pain in the back. When a patient has pain in the back and does not conform to the conditions dis-

cussed here tonight and prostatic infection exists, a definite effort to cure the prostatic infection should be carried out before any manipulation or operative procedure is advised.

DR. MYRON O. HENRY: I hardly agree with Dr. Nelson in that most of these cases are lumbo-sacral strains. I don't think we ought to feel they all are, because there are some of these cases which are definitely sacro-iliac. I think we have one of them right here in the room. Those cases come most commonly from long automobile rides, leading to fatigue of the muscles in the back. The obstetricians can tell us of many, many sacro-iliac strains, but these are not traumatic. Dr. Nelson's paper emphasizing the careful, methodical examination is very, very important.

DR. M. H. NATHANSON: I would like to ask Dr. Nelson if the relief by strapping would differentiate these conditions.

DR. HARVEY NELSON: I do not think that the relief by strapping would be diagnostic. Theoretically, more relief would come in the sacro-iliac strain, but any lower back strain would usually be relieved to some extent by strapping.

INAUGURAL DISSERTATION
HYPERTHYROIDISM: END-RESULTS IN A
SERIES OF CASES FOUR YEARS AFTER
SURGICAL TREATMENT

LEO MURPHY, M.D.

(Complete paper on page 267.)

DISCUSSION

DR. C. A. MCKINLEY: Dr. Murphy is to be congratulated upon his excellent paper which has revealed gratifying therapeutic results. All too few reports have been made of end results after surgery, and his record of 76 per cent of patients considering themselves well four and more years after thyroidectomy is very satisfactory.

Although we tend to emphasize surgical treatment, and I think correctly, it is surprising to note in a review of the literature in how many centers series of cases after surgical and medical treatment are being compared. One recent Scandinavian report emphasizes the favorable results obtained by medical treatment which they consider gives results in patients below the fourth decade of life with a basal metabolism not over fifty per cent above normal. In the fourth decade of life and beyond, in consideration of other factors, such as hypertension that enter to increase the cardiac work, it would seem inadvisable to choose the longer and less certain medical management in place of quicker thyroidectomy.

In 1927, before this Society in a paper entitled "Atypical Hyperthyroidism," I described a group of cases in which the manifestations of hyperthyroidism were mild and of varying intensity without marked tachycardia, and mentioned that when of long standing the cardiac picture with auricular fibrillation might predominate. At that stage the hyperthyroidism, although masked as heart disease, could be established as the underlying disease by careful study and indicated thyroidectomy whenever possible. After publication in the JOURNAL

LANCET in 1928, I noted that S. Levine in 1924 had called attention to a similar group of cases.

DR. O. J. CAMPBELL: In this very excellent paper are emphasized two factors, the proper understanding and evaluation of which will avoid a misunderstanding as to the efficacy of surgery in the treatment of hyperthyroidism.

The first of these factors is the careful selection of cases. Dr. Murphy's cases were all frank, definite cases of hyperthyroidism. Had he included border-line cases or cases in which the diagnosis was doubtful, there would have been a higher percentage of unsatisfactory results.

The second factor which I have in mind is his recognition of the value of secondary operations. Too often, the ability of the thyroid to regenerate is not appreciated. Recurrence of symptoms following thyroidectomy is not alone a question of the amount of tissue removed at the operation, although this is a factor in many cases, but, I believe, is more often due to hypertrophy of the remaining thyroid tissue.

I have in mind a case which illustrates this point. A young man presented himself at the University Hospital with a very fulminating case of hyperthyroidism, and with a history of having been twice operated for this condition. As I recall, his basal rate was approximately plus 70 or plus 80. At that time I concluded that he had received inadequate operations.

We operated this man after suitable preparation, and removed practically all of his thyroid tissue except small pieces overlying the posterior capsule. The immediate post-operative response was excellent. His basal metabolic rate dropped to approximately the normal level. I was much surprised to see this man again about nine months later with a return of hyperthyroidism of approximately the same degree as before. On palpation there was a large amount of thyroid tissue on the left side of his trachea. Again, after suitable preparation, we re-operated, and I attempted to do a total thyroidectomy, leaving only a little capsule to protect the parathyroids. He was discharged from the hospital in excellent condition, returned to his job as a printer, and remained well for about three years, which was as long as we were able to follow him. My original conclusion, that inadequate removal of thyroid tissue had been done on his first operation, was very obviously not justified.

DR. A. A. ZIEROLD: I wish to join my thanks with the others for the enjoyable and excellent paper which Dr. Murphy has given.

I was interested to see that Dr. Murphy followed rather closely the classification of Wegelin, and that he made a very distinct separation between hyperthyroidism and exophthalmic goiter.

For some time there has been a tendency to get away from the original description of Graves, but now I think we are returning to a consideration of Grave's disease as a separate entity with the idea that it is a qualitative disease rather than a quantitative one. In some cases I think the question can be reasonably raised as to whether the goiter may not equally be considered a result or a cause. We have in Grave's disease hyper-

thyroidism plus an unknown quantity,—plus some other stimulus or disturbance of the sympathetic nervous system of which little is known. If it is a quantitative disturbance of the thyroid gland total extirpation or extensive resection should uniformly correct it. In my opinion, from a rather brief experience, it is not the amount of gland that is removed that determines the frequency of recurrences, but rather the character of the individual and the character of the disease; the reaction of that individual to his disease, and I believe that we can continue to do a classical standardized operation without expecting to incur a high percentage of recurrences.

I noticed that Dr. Murphy ligated some cases of Grave's disease. It is interesting to know that someone is finding difficulty in treating cases with Lugol's solution alone. The fact that some cases do not respond to this treatment is evidence, to my mind, that the disease is not a quantitative one but a qualitative one. I believe there is one thing that we should remember in treating this type of case. The infrequently noted individual who will not respond to exhibition of iodine, responds rather poorly even to ligation and is intolerant of any operative procedure whatsoever.

DR. J. M. HAYES: I want to congratulate Dr. Murphy on his excellent presentation of his excellent results. I agree with Dr. Campbell to a certain extent. There, no doubt, are some patients who seem to regenerate thyroid tissue rapidly. Recurrences of hyperthyroidism in these is not usually due to removal of insufficient amount of thyroid tissue at the time of operation. On the other hand, I do believe that the greater number of recurrences are due to insufficient removal of thyroid tissue at the time of operation.

Not long ago I saw a patient who had been operated twice, and apparently nearly all the thyroid tissue removed. At the point where the left superior pole was ligated some thyroid tissue was allowed to remain. About two years later this tissue nodule had increased in size until it was almost an inch in diameter. No other thyroid tissue could be palpated, yet the patient developed a marked hyperthyroidism with a Basal Metabolic Rate of plus 50 per cent. This nodule was removed and the patient has been well since.

Just today I saw a patient in the office whom I did a partial thyroidectomy on a year ago. I removed about all but the posterior capsule at operation. About six months later she developed a hyperthyroidism and had to have a thyroid extract for a time. Today she had a definite hyperthyroidism again with a Basal Metabolic Rate of plus 27 per cent.

DR. LEO MURPHY: I wish to thank the Doctors for their discussions and kind comments. The case referred to by Dr. Campbell requiring multiple operations is similar to one reported recently by Phemister in which, despite repeated operation and irradiation, the patient died from Hyperthyroidism. At autopsy no trace of thyroid tissue could be found.

If we were to assume the operative mortality in Hyperthyroidism to be irreducible at the present time, then certainly our attention should next be directed

toward reducing the number of patients in whom the end results following surgical treatment fall short of being satisfactory. Not the least among the factors obviously influencing the end result is a scrupulous accuracy in diagnosis to the end that unnecessary, unwarranted operations on the thyroid gland will be eliminated. In Exophthalmic goiter the importance of removal of the pyramidal lobe as a routine step in the operation should be mentioned. The range of Hyperthyroidism is indeed wide. The optimum field for the surgeon lies somewhere between the extreme end zones.

INAUGURAL DISSERTATION
ROENTGEN OBSERVATIONS ON THE
INTERLOBAR PLEURA

LEO G. RIGLER, M. D.

SUMMARY

The roentgen diagnosis of diseases of the interlobar pleura is of especial importance because lesions in these reflections are so deep-seated they give few clinical or physical signs by which they may be identified. The normal anatomy and its variations is an important consideration. The position and direction of the interlobar pleural surfaces is very variable. Anomalous lobes produce several variable fissures.

Normally, the secondary fissure on the right is frequently visible in the postero-anterior roentgenogram. The main fissures are occasionally seen in the lateral view. The anomalous fissures are almost always visible if the extra lobes are present. The Azygoes lobe at the right apex and the inferior accessory lobes on both sides are those most frequently seen.

The position of the secondary fissure on the right is of great importance as it indicates most clearly the gradual retraction and shrinkage of the upper lobe from fibrosis or atelectasis.

Free fluid in the pleural cavity often extends into the interlobar fissures and may thus simulate the appearance of encapsulated effusion. The author has observed this phenomenon in numerous cases. It is particularly apt to occur with the patient in the decubitus positions. It is of importance, as it may be the first sign of a free pleural effusion. The author has also observed free fluid extending into the fissure of the anomalous inferior accessory lobe. Early in an empyema, the extension of the pus into the interlobar fissure is frequently observed. These usually result in encapsulations. During the course of the lobar pneumonia, especially on the right side, it is extremely common to observe a thickening of the interlobar pleura. This, I believe, is due to the small amount of serous fluid present in almost all cases of pneumonia, sucked into the fissures by capillarity.

Encapsulated effusions in the interlobar fissures are very common and are rarely diagnosed without the aid of the roentgen rays. On the right side, three possible encapsulations occur; in the main fissure between the upper and lower lobes, in the secondary fissure between the upper and middle lobes, and in the main fissure between the middle and lower lobes. Two or more of these may be present simultaneously. On the left only

one occurs. The secondary fissure encapsulations are readily recognized in either postero-anterior or lateral views. In the main fissure, however, encysted fluid gives a very diffuse shadow in the postero-anterior view, because of its obliquity. The lateral view will clarify the situation. With the roentgenogram, an interlobar encapsulation may be followed perfectly from its inception as a broad band across the lung during the course of a pneumonia, through its increase in size, the development of a diamond or oval shape, the decrease in size, and eventual disappearance, leaving a thickened band as a residue. If communication with a bronchus occurs the gas bubble may make distinction from a lung abscess difficult.

Interlobar encapsulations must be distinguished from lobar pneumonia of the middle lobe chronic indurative or unresolved pneumonia, lung abscess, lung tumors, pleural tumors and atelectasis of the lower lobe. The differentiation can usually be made by careful roentgen study. Particular care must be exercised not to confuse the shadow of a high diaphragm overlapping the heart shadow, in the lateral view, with a main fissure encapsulation.

DISCUSSION

DR. R. G. ALLISON: Dr. Rigler, in his usual style, has left very little for anyone to discuss. I have followed this work of his for a number of years at the University, and I know it has been a help to his graduate students and a great many of us who graduated previously. He has been very interested in the subject and I think he has contributed to all of our knowledge on the subject.

I think it is a most valuable paper and a most valuable contribution to medicine in general.

DR. M. A. SHILLINGTON (*by invitation*):

After a presentation of this kind, we cannot help but have the deepest regard for Dr. Roentgen. We further must hold in high esteem a man who has used the Roentgen ray so successfully in research and clinical application.

About two weeks ago we listened to Dr. D. R. Scammon give an interesting paper on the use of the x-ray in research on embryology. Tonight Dr. Rigler has shown us how x-ray has helped to clear up anatomical problems and has demonstrated that there are now always three lobes in the right lung but sometimes four and even five lobes.

The x-ray has its principal application in its clinical use. In this respect the x-ray has made some of us younger men a bit lazy. When Dr. Ulrich first practiced medicine, he carefully used his five senses and deducted a great deal about a patient. Now the majority of us say, when a patient is ill, "Let's take a picture," instead of our own minute examination. On the other hand, the saving to the patient of needless handling during physical examination is often times to the patient's credit.

I cannot help but feel that the man who practiced medicine before the use of the Roentgen ray deserves extreme credit for thinking things out which things are now found out for us by the use of this ray.

DR. H. L. ULRICH: I think that possibly we have

gotten a little lazy with such competent roentgenologists around. Our efforts to expect to make out some of these fissures by physical examination are absurd; it could not be done. I am deeply interested and pleased to see this demonstration here this evening. I had forgotten there were so many fissures. It is remarkable how he has elucidated this particular form of chest pathology.

I think we used to make diagnosis of the minor interlobar fissure. We used to do that but I don't think we did it on the main fissures at all.

DR. F. W. WITTICH: I would like to mention here the three valuable x-ray studies of the chest by Dr. Rigler. First those on the oesophagus and then those on the detection of small amounts of fluid in the thoracic cavity by having films taken in the lateral decubitus, etc., and more recently his observations on the pulmonary lobes and the fissures together with their anomalies, as well as the behavior of fluids in these fissures and their x-ray interpretation. They make the clinician feel quite helpless in trying to interpret these things by physical examination alone.

I think the practical thing one gets from this demonstration is the fact that the antero-posterior and the lateral plates are almost invaluable in these rather confused clinical pictures, especially in lobar pneumonia when the crisis is passed and there is a persistent temperature of varying degree and the physical signs are somewhat puzzling. If one does not get fluid or pus after inserting a needle in the mid-axillary line in the axilla over or near the fissure, the x-ray procedure mentioned is indispensable to arrive at a diagnosis.

I feel that this work of Dr. Rigler's has been very elucidating and I am very grateful for having heard his lecture tonight.

The meeting adjourned.

Respectfully submitted

James K. Anderson, M.D.

Secretary Pro-tem

SOCIETIES

GREAT NORTHERN RAILWAY SURGEONS' ASSOCIATION

ANNUAL MEETING

Portland, Oregon

Monday and Tuesday, June 19-20, 1933

PRELIMINARY PROGRAM

SUNDAY, JUNE 18

9 o'Clock A. M.

Scenic boat ride for members and families on Upper Columbia River to Bonneville for a salmon barbecue and visit to government fish hatcheries. Attractive scenery for members and families. This very attractive and unusual innovation will require the members to arrive one day early but it is worth it.

Please save this program! Take it home to your wife. She won't forget the dates.

Members from the eastern district will ride on Train No. 1, leaving St. Paul at 8:50 A. M., Thursday, June 15, and arriving in Seattle on Saturday, June 17, at 8:00 A. M., and arriving in Portland on Saturday evening, June 17.

TENTATIVE PROGRAM

MONDAY, JUNE 19

9 o'Clock A. M.

1. "Traumatic Rupture of Spleen," Report of Three Cases, Dr. C. W. Burns, Winnipeg, Man.
Discussion to be opened by Dr. Ralph M. Dodson, Portland, Ore.
2. "Osteomyelitis," Dr. Richard B. Dillehunt, Dean of the University of Oregon Medical School and Clinical Professor of Surgery, Portland, Ore.
3. "The Industrial Aspects of Low Back Strain," Dr. Eugene W. Rockey, Assistant Clinical Professor of Surgery, University of Oregon Medical School, Chief Medical Advisor of the Oregon State Industrial Accident Commission and Attending Surgeon of United States Veterans' Hospital No. 77, Portland, Ore.
4. "The Treatment of Supracondylar Fractures of the Humerus," (Lantern Slides), Dr. P. O. Neraal, Cut Bank, Mont.
Discussion to be opened by Dr. John G. Cunningham, Spokane, Wash.
5. "The Anderson Traction Splint Method in Treatment of Fractures of the Femur," Dr. H. E. Cleveland, Burlington, Wash.
Discussion to be opened by Dr. Roger S. Anderson, Seattle, Wash.
6. "The Application of First Aid Splints to Fractures of the Upper and Lower Extremity" (Moving Pictures), Dr. R. C. Webb, Minneapolis.

12:30 o'Clock P. M.

Luncheon

MONDAY AFTERNOON

2 o'Clock P. M.

Golf Tournament, Waverly Country Club.

The Golf Committee, after due consideration, may award the cup to one of the following:

1. The low net, i. e., total score minus handicap, or
2. The "low gross," i. e., total score plus handicap, or
3. The lowest score, or the total of all three.

The green fees will be one dollar.

A scenic drive will be provided for the ladies and for those who do not enter the golf tournament.

MONDAY EVENING

Hotel Benson

6:30 o'Clock P. M.

Hors d'oeuvres, Rose Parlor.

7:00 o'Clock P. M.

Annual Banquet, Crystal Room.

Orchestra Selections.

Illustrated Address: "Wild Life of Alaska," Mr. William L. Finley, Portland, Ore.

TUESDAY, JUNE 20
9:00 o'Clock A. M.

1. "The Treatment of the Fractures of the Mandible" (Lantern Slides), Dr. Roy F. West, D.D.S., Seattle, Wash.
2. "Accidents, Neuroses and Compensation; Modern Concepts of Treatment," Dr. Laurence Selling, Clinical Professor of Medicine, University of Oregon Medical School, Portland, Ore.
3. "Electric Cataract," Dr. Richard W. Perry, Seattle, Wash.
Discussion to be opened by Dr. Frederick A. Kiehle, Portland, Ore.
4. "Problems in the Diagnosis of Tuberculosis," Dr. Ray W. Matson, Assistant Clinical Professor of Medicine, University of Oregon Medical School, Portland, Ore.
5. "Fractures of the Vertebra with Spinal Cord Lesions; Indications for Laminectomy," Dr. A. J. McLean, Instructor in Surgery and Neuro-Psychiatry, University of Oregon Medical School, Portland, Ore.
6. "Traumatic Rupture of the Kidney," Report of Three Cases, Dr. A. D. Haskell, Alexandria, Minn.
Discussion to be opened by Dr. Roy C. McDaniel, Portland, Ore.

TUESDAY AFTERNOON
2:00 o'Clock P. M.

A scenic drive up the Columbia River Highway around Mount Hood. Trout dinner at Rhododendron Tavern.

Arthur N. Collins, M.D., R. C. Webb, M.D.,
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President. Minneapolis, Minn.

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. Arthur N. Russeth, Minneapolis was recently married to Miss Neva V. Borgerson of that city.

The American College of Physicians will hold their annual meeting in Chicago, April 16 to 20th, 1934.

Dr. J. F. Barthels, well known physician of Howard, S. D., died recently, following a sudden heart attack.

Dr. M. J. McKenna, Enderlin, N. D. has moved to Graceville, Minn., where he will continue in general practice.

Dr. C. A. Corse, formerly at Verndale, has

moved to Kelliher, Minn., where he will continue his general practice.

Dr. F. E. Hill, Duluth, has returned from New York City, where he spent six weeks in post-graduate work.

Dr. A. E. Olson, Duluth, has been appointed a member of the Board of Regents of the University of Minnesota.

Dr. J. E. Hetherington, has decided to remain in Grand Forks, N. D. and will confine his practice to internal medicine.

Dr. W. B. Wells, a recent University of Minnesota graduate, has opened offices for general practice at Sherburn, Minn.

Dr. H. O. Danford, who formerly resided at Bismarck, was killed in an automobile accident at Seattle, Wash., last month.

The Great Northern Railway Surgeons Association will hold their annual meeting at Portland, Oregon, on June 18 and 19.

Dr. Howard Marsh, Chicago, has taken over the offices and practice of the late Dr. F. W. Schecher, at St. Bonifacius, Minn.

Dr. V. S. Counsellor, Rochester, was the guest speaker at the April meeting of the Blue Earth Medical Society, held at Mankato, Minn.

Dr. D. S. Kalayjian, who has been spending the winter months in California, has returned to his home at Parker, S. D. and resumed practice.

Drs. Heimark and Bailey, have withdrawn from the Clinic at Fairmount, Minn., and will open offices in that city for general practice.

Dr. Waltman Walters, Rochester, was one of the leading speakers at the recent meeting of the American Surgical Association held at Washington, D. C.

Dr. C. D. Lufkin has recently opened offices for general practice at Northfield, Minn. The doctor is a graduate of the University of Minnesota, in the class of 1928.

Dr. N. O. Pearce, president of the Minnesota State Medical Association, was the guest speaker at the Southwestern Medical Society held at Lakefield, Minn., last month.

The Yankton Medical Society held their monthly meeting at Vermillion, S. D. with Drs. O. J. Fay and Joseph Brown of Des Moines, Iowa, as the visiting speakers.

Dr. Wm. C. Bernstein, Waseca, Minn., will sail on May 20th, for a three months trip

through Europe. He plans on several weeks study at the Berlin and Paris clinics.

The annual golf tournament of the Minnesota State Medical Association will be held at Rochester on May 24th. The silver cup will be played for, under the usual handicap rules.

Dr. Henry E. Michelson, Minneapolis, was the guest speaker at the April meeting of the Wayne County Medical Society at Detroit, Mich. His paper presented was "Cancer of the Skin."

At the monthly meeting of the Richland County Medical Society, held at Wahpeton, N. D. Dr. B. Thane, Wahpeton, was elected president and Dr. N. H. Greenman, Fairmount, secretary.

Minneapolis was placed fourth in cities of the United States ranging in population from 250,000 to 500,000 in the national health conservation contest of the United States Chamber of Commerce.

Dr. Dean Lewis, president of the American Medical Association, will be present at all of the sessions of the Minnesota State meeting at Rochester, on May 22-24th, being a special guest visitor.

Dr. J. A. Myers, Minneapolis, was the guest speaker before the Medical Society at Peoria, Ill., on April 18th, his topic being, "The Role of Childhood Tuberculosis in the Prevention of Adult Tuberculosis."

Dr. G. W. Dahlquist who has been connected with the Veterans Administration Hospital work at Fargo, for the past ten years, has resigned and will return to Lancaster, Minn., and open offices for general practice.

The Kandiyohi-Swift Medical Society held their regular monthly meeting at Atwater, Minn., on April 22nd. Following a fine dinner, the members enjoyed a lecture on "How to Live," given by Dr. Wm. A. O'Brien, Minneapolis.

The Mower County Medical Society held its April meeting at Austin, Minn., with a large attendance of members and visitors. Dr. Harold C. Habein of the Mayo Clinic gave a lecture on "Diagnosis of Acute Abdominal Emergencies."

Dr. Clarissa C. Richardson, herself a physician and wife of Dr. H. E. Richardson, St. Paul, died recently after a short illness. Mrs. Richardson had been active in her profession in the Twin Cities during the past 15 years.

At the annual meeting of the Fairview Hospital, Minneapolis, Dr. E. K. Giere, was elected chief of staff, Dr. F. H. Hacking, vice-chief, and Dr. H. R. Leland, secretary. The retiring

chief, Dr. M. Sundt, was presented with a gold ash tray.

Dr. F. W. Schecher, who has been in active practice for nearly 25 years at St. Bonifacius, Minn., died on April 12th, from a sudden heart attack. Dr. Schecher was born in Lohi, Germany, and graduated from the Chicago University.

Dr. R. E. Scammon, dean of the medical sciences at the University of Minnesota, was the guest speaker at the Rice County Medical Society at Northfield, Minn., last month, his topic, "Relation of the University Hospital to the Medical Profession."

The Blue Earth Medical Society held their May meeting at Fairmont, Minn., with Drs. Scammon and Pierce, Minneapolis, as guest speakers. Officers of the society are Dr. H. Boysen, president; Dr. A. W. Sommer, vice-president, and Dr. R. C. Hunt, secretary.

The Minnesota Hospital Association will hold its annual meeting at the Curtis Hotel, Minneapolis, May 25 and 26th. It is expected that there will be over 500 executives, directors of nursing schools, and dietitians present. Nationally known authorities will be on the program as speakers.

The Minnesota Pathological Society held their regular monthly meeting on April 18th, with two papers being presented. Dr. Kano Ikeda on "Unusual Forms of Pulmonary Fat Embolism" and Dr. N. H. Lufkin, "Obstruction of the Right Lymphatic Duct with a Case Report."

The Minnesota Academy of Medicine held their monthly meeting at the Town and Country Club on May 10th, with the following program. "Calcium Deficiency Associated with Functional Gastrointestinal Disturbances in Adults." by Dr. E. L. Gardner and "The Tuberculodermas of the Face" by Dr. H. E. Michelson.

The Hennepin County Medical Society elected new officers this month as follows, Dr. C. A. Stewart, president; Dr. Martin Nordland, first vice-president; Dr. O. S. Hansen, second vice-president and the board of trustees are Drs. A. T. Mann, and S. Marx White. Drs. E. L. Gardner and H. L. Ulrich, board of ethics.

Dr. E. A. Meyerding, St. Paul, executive secretary of the Minnesota State Medical association and of the Minnesota Public Health association, has been promoted to the grade of colonel of the medical reserve corps. For 15 years prior to the World war, Dr. Meyerding served in the

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Minnesota national guard. During the war he was a major in the army corps.

The Sixth District Medical Society had the largest attendance of the season at their meeting held at Bismarck, N. D., on May 2nd. Among the visiting speakers was Dr. J. A. Myers, Minneapolis, chairman of the editorial board of the JOURNAL-LANCET, who presented two papers, and Dr. E. A. Stewart, Minnesota, Minn., and Mr. Sather, Assistant Attorney General of North Dakota, presenting papers.

A bill passed by Minnesota legislation agreed to permit applicants for licenses to practice pharmacy to be examined if they have had two years work at schools of pharmacy and have had at least two years practical experience in hospital pharmacies. This bill proposes, too, that persons now registered as assistant pharmacists, who have worked in hospital pharmacies for four years or more, shall be eligible to be examined for licenses to practice pharmacy, regardless of whether or not they have attended schools of pharmacy.

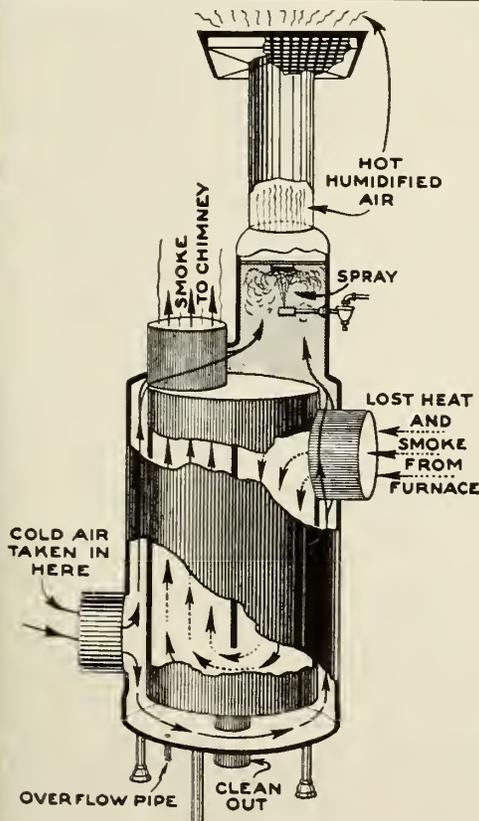
Among the nationally known speakers who are on the program for the Minnesota State meeting on May 22-24th will be Dr. James Ewing, New York, professor of oncology at Cornell University; Dr. Morris Fishbein, Chi-

cago, editor of the Journal of the American Medical Association; Dr. H. L. Kretschmer, Chicago, professor of urology at Rush Medical College; Dr. Philip C. Jeans, Iowa City, professor of pediatrics at the University of Iowa, and Dr. Walter Simpson, Dayton, Ohio, president of the American Society of Clinical Pathologists.

C. W. Brunelle, alias Chief Little Cloud, sixty years of age, who resides in Minneapolis, entered a plea of guilty to a charge of practicing healing without a Basic Science Certificate in the Municipal Court at Fairbault, Minn. "Chief Little Cloud" is a half breed Indian (Chippewa) and is employed by the City of Minneapolis as a garbage collector. During his spare moments, and particularly on Saturday afternoons and Sundays, he has been making a specialty of driving down to Faribault to see a number of patients. In the present prosecution he diagnosed the ailment of one patient as bone rheumatism and left some medicine, making a charge of \$7.00, which was paid to him in cash. This party, also, was swindled out of one hundred and twenty-five dollars by "Reverend" Hawkins who was convicted in September 1932, on a charge of grand larceny in the second degree growing out of his "healing" activities.

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The JOURNAL LANCET

Minneapolis, Minnesota
June 1, 1933

Vol. LIII, No. 11
New Series

Memories of European Student Life Forty and Fifty Years Ago*

Arnold Schwyzer, M.D.
St. Paul

A SHORT while ago your dean, Dr. Scammon, asked me to talk to you on European student life of my days. Reflex-like I tried to escape. But as I looked into the doctor's face, his smile, that Scammon smile, that Risus Scammonicus divinus, disarmed me. So whatever is going to happen you will have to chalk it up to him.

To speak generally of European student life would make things too abstract. I should prefer to develop a somewhat concrete picture. The French, the German, the Austrian, the English, the Scandinavian, and the Italian students at the end of the last century had assuredly many common traits in which they differed then and differ even now from the American student. But I will only speak of the student life as we, the Swiss boys, had it. It closely resembled the German and Austrian student's life and was perhaps nearest in kind to the Scandinavian.

A fundamental difference from the American student's preparation was what often looked like an unfairly severe overburdening with studies in the pre-university schooling. A little more regard for the value of carefree play among youngsters would have been immensely appreciated, and would at least have had a good physical effect. On the other hand it gave the European student a vastly better pre-university preparation. And to make this more clear I want to say a word about the preliminary schooling.

*An informal talk before the medical "Six o'Clock Club," a gathering of students and members of the faculty of the University of Minnesota, December 14, 1932.

After six years of common grade-school the young folks in my native town, Zurich, in Switzerland, had four different kinds of schools to choose from, one of which to enter was obligatory. The future laborers and most modest aspirants had and have today to go to an evening school for another two years; others enter a secondary school which lasts a minimum of three years. Those aspiring to higher positions in life like engineers, architects, chemists, foresters, etc., or striving for higher places in business life go to the industrial school which takes four years, at the end of which time they may or may not enter the federal high technic school or other special ones. Finally, the young man who wants to go to the University has to go through the so-called Gymnasium, which takes six and one-half years. These six and one-half years roughly correspond to our high school work here. But only roughly.

These preparatory years were perhaps too hard. They had to weed out all those who did not seem fit. The classes gradually shrunk to about one-fourth of the original number. In the overwhelming majority of the instances, however, it was a voluntary exit for varied reasons. There was surely here and there some useless pedantry in over-exact grammar work in the languages. On the other hand, just such exact grammar work made for sharp discipline in thinking and expression; and the eminent professor Sahli of Bern, whom you all know, highly emphasized

not long ago the great training value of the exact study of the old classic languages. What made it possible to get through with the enormous penum was the outstanding excellence of our pre-academic teachers. This, to my mind, is a most important point.

A number of these teachers were at the same time professors at the University and recognized authorities in their field. They were able to interest us in our work so that it was not half the drudgery it would have been otherwise. The examination for entering the university was probably as hard as any later on and so quite naturally to be a full-fledged university student meant a great deal to us.

You had now as a medical student a minimum of five years before you, which later was extended to six years. You had to choose which university to enter. There was no overcrowding and you were free to select. Semesters spent at German or Austrian universities counted in full. Particularly in Switzerland a good knowledge of several languages is rather necessary or at least desirable. Therefore many of the students from the French speaking parts of Switzerland would come to the universities of Bern, Basle, or Zurich, where German was spoken and the lectures were in that tongue. On the other hand many of us went to Geneva for the first half of the medical studies, the pre-clinical ones. In comparing this procedure to your present student life here, I would say that on account of the increasing volume of material to be conquered a more systematic plan for the curriculum has gradually become unavoidable.

We had no examinations to worry about until the end of our pre-clinical time, and then again the final examination, which included the licence to practice anywhere in Switzerland. But woe to the fellow who had abused his academic freedom! You could take as many or as few courses in as many semesters as you pleased (or as Papa would permit), and you could take your individual semesters where you liked. But except for perhaps a short summer semester in grand old Heidelberg or in the quaint and venerable Wuerzburg to see some of the German student life, we knew well enough that changing teachers meant disruption of our studies, and that such roaming was to be reserved for the summer vacation or after graduation. A few months in sunny Italy, another summer vacation in England and Scotland widened the general horizon and provided glorious memories. But with all this freedom there came the sense of responsibility and we saw that every semester fooled

away in in-exact work would leave a permanent gap with the average medical student.

Many of us divided our studies between Geneva and Zurich. The first half of the medical curriculum comprised Anatomy, Histology, Physiology; then Physics, Chemistry, Zoology, and Botany.

Anatomy was the foremost study in the first two years. From 8 to 12 for two long winter semesters we were in the dissecting room. One hour every day there was a conference. One of the second year students had to give a discourse on a subject which he had to prepare; and also demonstrate on anatomic specimens.

In Zurich, anatomy was taught by Hermann Meyer. Let me mention the story of an interesting discovery. Prof. Cullmann in Zurich had invented what engineers call graphical static. By this method he could construct on paper the lines of pressure and of traction of a bridge or other structure. Meyer wondered when looking at a longitudinally bisected femur bone, whether the peculiar picture of the gracefully curved trabeculae of the spongy part of the neck and head had possibly a connection with Cullmann's lines of traction and pressure. He spoke to Cullmann about it and asked him to design a supporting structure for the interior of such a bone according to his calculations. When the sketch was made and Meyer put the bisected femur alongside, you can imagine what a wonderful revelation it was when both showed the identical construction. The deposit of lime salts was thus dependent in some way on physical forces, and occurred just where it was needed!

In *Histology* we would cut our sections free-hand with a razor. The tissue was held between two pieces of hardened liver, and the sections were of course very uneven, but at least at the edges they thinned out. Sketches had to be made of everything. Exactness in observation was thus promoted. For your collections, which every student made, we received in addition many microtome sections.

The lectures on *Physics* with innumerable experiments always well and elaborately prepared, were very well given as a matter of course in Geneva the home town of Raoul Pictet, who showed that even the so-called permanent gases, those gases that even a Faraday had been unable to condense, had to give in under very low temperatures combined with enormous pressure.

Chemistry was taught by our beloved Graebe. Though this field was less advanced, of course 40 or 50 years ago, it was extremely fascinating

to see how more and more a deeper understanding came in organic chemistry and how a vitalistic fog gradually was lifted from human understanding by the rays of light coming from synthesis. New domains were constantly entered, old barriers broken down. It was then not an old matter-of-fact story, it was real live revelation. The immensity of importance of this field was brought to vivid consciousness through a practical demonstration by our own teacher. Graebe and Liebermann had been able to make synthetically Alizarin, the important red coloring matter used as a dye, for instance, for the military trousers of the French soldiers. Southern France had been cultivating the plant, the garance, as a staple article; and the French government saw itself constrained to buy the patent to save the farmers from ruin by too rapid a change. Each of the chemists—it transpired among us students—had received a million francs! The detection of the connection with the Anthracene and Anthrachinone and its oxidation yielding phthalic acid had given the clue. You see, we could not escape live interest; everywhere was plenty for enthusiasm. I mentioned some of these examples to make you see that everywhere things were doing, developing, boiling.

Embryology was not a required course yet. We had no books on it, but Fol gave free lectures and we were there taking notes till the writer's cramp hurt us. These were all new things of grandiose importance for a better look into nature's workshop.

Physiology was taught by Schiff, an intellectual giant. No lectures have I heard that were more fascinating than when the short and somewhat portly Schiff with his large white beard, pipe in his mouth, came into the lecture room and started to tell us of intricate experiments; for instance, to determine the course of the gustatory fibres, or other subjects where some of his experiments had seemed to get results conflicting with those of his friend, Claude Bernard, in Paris, and where, after personal inspection of the other's work, they would detect the cause of the difference and, exactly by this, find new facts.

Schiff had just about then published his results in total thyroidectomy. The role of the thyroid was still all in a muddle. Some even thought its main role was that of a damper and regulator of the cerebral circulation due to the great vascularity of the gland. The parathyroids were not yet known. Schiff found that after total thyroidectomy all his cats and dogs died from tetany. But rabbits and other herbivora did not die and became myoedematous.

Working on the goiter problem from the surgical side, there was in Geneva, Reverdin; the kindly and courteous gentleman Reverdin, the first to conceive and execute the idea of skin transplantation. He and Kocher in Bern, and Socin in Basle, and Kroenlein in Zurich worked intensely, not only on the goiter problem, but also in the development and progress of surgery in general. It would be carrying owls to Athens, as we moderns say coal to Newcastle, to dilate on that point. But I have to mention some of the names to show the younger ones among us the active part we saw everywhere taken in the rapid development of modern medicine. And still I hardly ever saw a laparotomy as a student.

"No clinic today on account of laparotomy," would be the sign on the door. Lister's fear of air infection was still so great that students could not be admitted. But as under-assistants, externs, we got more of a chance. In the summer vacation 1896 I was at the Royal Infirmary in Edinborough, where I saw a clinical teacher operating in an old pus and blood stained Prince Albert coat. Pean in Paris did it neater. He came in in full dress, swallowtail coat, turned up the cuffs of his immaculately white shirt, put on a white moderate-sized apron and made in a few minutes a most elegant vaginal hysterectomy in a case of gonorrhoeal salpingitis. We, at home, had to scrub our hands for 15, mostly 20 minutes, before operation; and after a septic operation 24 hours had to elapse before one dared operate on another case. Much later Mickulicz of Breslau introduced cotton gloves, and then Halstead of Johns Hopkins, rubber gloves,—what a Godsend!

But if we had so few laparotomies, we had lots of bone and joint surgery on account of tuberculosis. As assistant in a county hospital in Switzerland, where we did not do half the amount of abdominal surgery per year I have been doing here in my private practice, I saw in one year as much surgery for bone and joint tuberculosis as I had in 40 years here. That will tell you that notwithstanding this depression we are still in God's own country.

To cite many names is tiresome for those who do not know the men, but I have at least to mention Sahli in medicine, Langhans and Klebs in pathology, Horner and Haab in ophthalmology, to give an idea to the more advanced students what eminent men were teaching.

Many fields were new. When Monakov gave his first lecture in Brain Pathology we were seven students who took that course, a painfully small group. One of these seven was Adolf Meyer,

now professor at Johns Hopkins. It was, of course, not a required lecture: but if time allowed, we would take other courses which interested us and in which outstanding men were lecturing, as perhaps in history of arts or similar subjects.

The psychiatric clinic of Forel was again most interesting. Forel was a fascinating personality. He at that time studied hypnosis which the school of Nancy had drastically brought to the attention of the medical world. I had one fine result myself while house physician in a general hospital. A girl of about 27 years had been in another county hospital for six months on account of a retention of urine lasting two years and a contracture in adduction of the right shoulder joint, lasting two and one-half years. I recognized it as belonging to that slop-jar group we called hysteria and used suggestion in the wake state with the help of a strong faradic brush. She extended her arm actively vertically in two days, after which the merciless brush sparked over the pubic area for about five or seven minutes on two successive days. She was cured, remained in the hospital for five or six months as unpaid maid, had no recurrence and was very grateful. In another case I made a painless tooth extraction in hypnosis. But after a complete failure in what we took to be a hysterical anorexia, I thought of Charcot's words "Ca nous rends des non-valeurs sociaux" (By hypnosis we create socially valueless beings) and have never gone back to it.

Bacteriology was in its early development. In the eighties of the last century practically every single year brought to light the agent of one or more infectious diseases. But the first laboratory course at the university of Zurich was only started in 1890. I took it while house surgeon at the university hospital. The aspiration of most of us was to become house surgeons in some hospital, some spending a year or two, or even four; some remaining an indefinite time in the hope of advancing in the teaching staff of the university.

After this hurried outline of the course of study you may want to hear a few words about the social part of the student's life in those days. Undoubtedly the *thirst for knowledge* seemed often to divert after a hard day's work into just plain thirst without that finer specialization. However, except for the more distant observer—it was not the drinking which brought the young men together in the evening, but the desire for social life. Light beer was consumed while lively discussion or entertainment went on. Then you heard what was going on in the world, the

law students mostly leading this conversation. Or teachers with their theories, or some new interesting finding in science was discussed, or music or the theater, a thousand and one things. Talking shop that was not generally interesting for the group was penalized. One outstanding feature was the singing of student songs, of which the repertoire was glorious, and ever so often a song would interrupt the conversation.

In a small university town the student is allowed many a freedom which is not taken sympathetically by the metropolitan. It may, of course, happen even in a small place that a new police officer appears on the scene who may have such a deficiency of culture as not to appreciate even some wonderful pianissimo of a young troubadour at midnight. We of the glee club, after tip-toeing into a private garden at midnight to serenade some young lady were rarely displeased with our performance. At one time revenge had to be taken for the lack of understanding on the part of the police.

An elaborate plan was laid. There was in the town an "Institute for the Blind and Deaf Mutes." The acquisition of the sign of this Institution became necessary and was the first move. A number of students then had to start a terribly dangerous-sounding row about five blocks from the central police station. It sounded serious and every available officer had to go. With an efficient preparation there was enough time to take down the sign signifying "Central Police Station" and to replace it with that of the "Institute for the Blind and Deaf Mutes." When the Bernese farmers arrived for early market there was the most hearty merriment offered the people at practically no expense. Only then was the mischief noticed by the police. However our hearts, of course, went out in sympathy to those two poor policemen who in broad daylight before this boisterously roaring populace had to climb up and remove the sign; and while boiling in their hearts, had to handle the blamed thing with care.

Of course there is an overflowing abundance of jolly and sunny memories. Some of the non-sense perpetrated must have been a healthful reaction from too stern a study, an antidote for neurasthenia. However, I have no memory that we ever did anything meaner than the example mentioned, and anything like rough hazing would not have been possible. Humor, not roughness, was the essence.

You might say, "Well then, what about your duels?" Duelling was done and is done today. It is mostly with the rapier, very rarely with

sword or pistol. The eyes, the temporal vessels and the jugulars were protected. Face and scalp were the only places exposed. But the sharp blades flew fast, and I remember some vicious gashes I had to sew up. It was and is only practiced by those who want to. They were in the minority in Switzerland, and their number is steadily decreasing. I am not going to defend now what I was never in favor of, but fencing is a wonderful exercise, renders the body agile and graceful and the mind alert. I have to admit one thing: it was probably due to the possibility of being challenged to a duel that nowhere was to be found a more correct courtesy in a young man's behaviour, combined with manly self-respect, than in the fencing hall.

What about the fraternities in continental Europe? They are comprised of students from all branches of science. We had academic singing societies, academic gymnastic societies in the form of closed fraternities. Of more recent years especially the sport societies have come to the foreground where they prepare for the Olympic games. A good half of the students in Switzerland were in my days in no society at all. The students, though, who give the characteristic picturesque appearance to the small university town, particularly in Germany, are those who wear colors, caps and breast bands. They are devoted to social gathering and friendships, and many to the sport of fencing and duelling, which was supposed to develop the gentleman out of the raw material. *De gustibus non est disputandum.* (Tastes cannot be disputed.)

University cities abroad usually are also centers of art, and as a side show the young student has much opportunity to enjoy art galleries, music, classical and modern drama, etc. Here his general training comes into its right. It is stimulated by the company of ladies of equal or better education in these fields. The more official university social events with ladies were three academic balls during the winter, glorious affairs for the student body as a whole. Then there were elaborate sleigh parties arranged by the individual fraternities. In spring several fraternities regularly had an all day outing with ladies, either

a walking or steamboat excursion, culminating in a grand dance in the evening. Some of the best liked professors were always invited and participated with their families. They seemed greatly to enjoy feeling young with the rest of us.

Let me add a word of comparison as to the manner of teaching of medicine here and abroad. Much advance is to be seen today, especially here in our country. The contact with patients in the hospital was in my days and is even today in continental Europe, with possible exception of France, not as well arranged as here. We had to try to get clerkships in the hospital to get nearer the patients, and the outpatient department had to help out, together with the wealth of the material presented in the clinics and lectures. The more frequent examinations here give the teacher a better insight into the knowledge of the student and make for a better regulated advance in the studies. The student in this country today is probably better prepared for the practice than abroad, especially in regard to therapy. The great difference lies in the fact that here the student is taught his medicine more in a strict school manner, while abroad he has more to train himself, and is made more responsible for looking out for himself. Here he gets a more rigid drilling in the things which concern the practical side of his profession. Many splendid forms of teaching which you have here, such as the clinical-pathological conferences, we did not have. What we particularly missed in those days, and what is surely of greatest value, is a general and I might say *official* closer contact between teachers and students, though there were, of course, always a privileged few. Gatherings like this here tonight were unknown. I wish very much we could have had them. But then, we would not have had a Doctor O'Brien to preside over us anyway!

In closing let me say that though we had much freedom, the sensible student after an initial soaring into the stratosphere of jubilant academic freedom, came down to earth rather promptly and buckled down to work. For work, work with enthusiasm and perseverance, was and is the key, the only key, to reach what is worth while in science.



Paroxysmal Premature Ventricular Contractions Induced by Swallowing: Case Report

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SINCE the vagus nerve innervates both the heart and the mucous membrane of the esophagus, it seems reasonable to suppose that stimulation of the vagus from the oesophageal branch might reflexly affect the heart in an inhibitory way. A few examples of this action have been recorded.

Starling¹ in 1921 reported a notable case of a patient who had had attacks of unconsciousness, induced by swallowing, due to failure of the ventricle to respond. He was able to abolish these attacks by atropine for a few weeks. Before he died, however, atropine did not relieve, and at autopsy a calcareous nodule was found at the division of the Bundle of His. This undoubtedly was the so-called Adams-Stokes syndrome.

In 1925, Rivers and Bueermann² reported three cases of syncope following the ingestion of food with symptoms of spasm of the cardia. These attacks lasted a few seconds to half a minute and were definitely associated with deglutition. One of these had a cardiac rate of forty during an attack of syncope, and another had a definite cardiospasm. Their description of the attacks does not tally with attacks of epilepsy.

Willius³ suggests that central vagal disturbances may be the causative factor in a case of complete heart-block without demonstrable cardiac disease. He also states⁴ that premature contractions are just as common in normal hearts as in those diseased; and he ascribes them to neurogenic influences.

Barnes⁵ also makes reference to reflex vagus action as a causative factor in premature contractions occurring with deglutition; and he suggests the use of atropine.

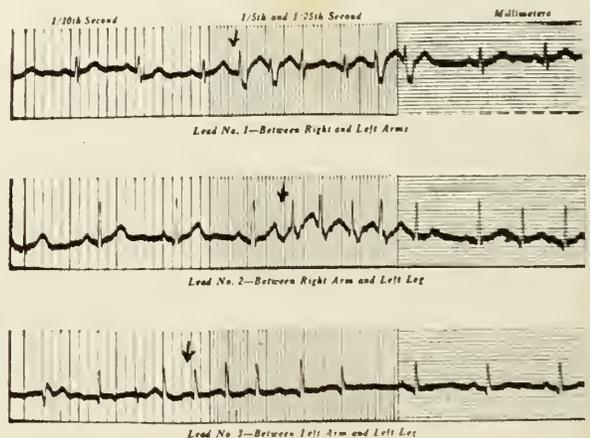
The average person does not, of course, experience any cardiac sensation in swallowing. Extrasystoles are common in nervous persons, and those who use tobacco excessively. This type of arrhythmia is a sign of functional disturbance of the heart and not of organic disease. Since the introduction of the electrocardiograph, we are enabled to determine whether the exciting focus of the extra systole or premature beat is in the auricles, in the ventricles, or in the junctional tissues.

The cases reported above were cases of heart block induced by reflex vagus action. The following is a case of reflex vagus action in which showers of extrasystoles precipitated by swallowing were obtained, instead of heart block:

In January, 1928, Dr. W. S. F., aged 40, complained of a peculiar thumping sensation over the precardium, which was brought on by swallowing. This disappeared for a while but recurred a number of times during the following three weeks, usually while eating. He also had several such attacks when at rest, one of them while reading in bed. It was not caused by exertion, and he had no dyspnea. The sensation was quite disagreeable.

He was given an apple, and just as he swallowed, he developed an arrhythmia which was observed by fluoroscope and by feeling of the pulse. This arrhythmia was so complete that one could not determine whether or not it was successive extrasystoles. An electrocardiogram was taken without swallowing which was found to be normal with a rate of 75 and a slight right ventricular preponderance. There was no disturbance of rhythm in this film. Another film was taken, and as he swallowed, there occurred a series of ventricular premature contractions with a sinus arrhythmia, the rate varying from 60 to 150.

The tonsillar tags were removed January 28, 1928, and a month later the symptoms from his heart condition disappeared. During this time
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Some Personal Experiences on Cataracts in India*

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IT would be quite possible for me to prepare for you a rather long and probably tiresome review of the current literature on this subject, which would enable me to follow it with an imposing looking bibliography which would supposedly impress you with the vast amount of reading I had done in the preparation thereof; but I choose not to do this, presupposing as I do that you, too, have read this same literature, and I do not wish to bore you with repetition. What I have to offer you in this short paper will perhaps be even less interesting.

The incident of cataract among our American population would seem to be slowly increasing. One of the factors in this increase can be attributed to our highly industrialized civilization, with its resultant trauma.

Whether the increase in the senile type is the result of the slow decadence of physical powers, or is due to the increased visual requirements necessitated by our vastly more complex modern civilization, or both, is a matter for conjecture.

Yet, in comparison to many of the older civilizations—especially Oriental—we are indeed fortunate in that our percentage of blindness due to cataract is much lower. Of course, in these Oriental countries, there are many other etiological factors to be considered; sociological, sanitary, nutritional, hygienic, climatic, etc.; while these factors must needs enter into the etiology of cataracts in any country, they are of lesser consequence in our hertofore more favored economic position; what the future may hold for us in this respect may be less favorable than in the past.

The literature on cataracts is voluminous—the various techniques are legion; most of them contain something of merit in selected cases or under certain conditions. For me to describe one or more of them would be merely reiteration of something you have all read and heard repeatedly discussed. All of us use one, or more, of these operative procedures, or some modification of them.

The successful operator must be thoroughly familiar with several of these techniques. He must be versatile. He does not use the same technique in each and every case. In fact he often

changes in the midst of an operation. It is necessary that he be able to do this in order to meet unexpected emergencies arising in individual cases. Many of the different types of operation are excellent, in fact most of them are, but no one operation fits all cases, and what may be a most successful technique in your hands, might prove a dismal failure in mine, but if I use the technique with which I am familiar, mine too is likely to be a success.

The successful surgeon must be experienced. This, I believe, is more necessary in cataract work than in almost any other branch of surgery. The individual who operates a half dozen cataracts yearly is no more competent to do consistently good work than the general surgeon who operates an occasional abdomen or thyroid.

Perhaps the next most necessary element for success is a careful selection of our cases. This was impressed upon me most forcibly during my work in the Orient. Most of us are blessed with a large amount of sympathy for human suffering, and there is something peculiarly appealing to this sympathy in a case of blindness. Because of the lack of laboratory facilities, except in a very few clinics, such as we enjoy and use at home—it is very essential that one be a keen and careful clinical observer. Here, we not only make a minute and careful examination of the eye and its appendages—the nose and throat, sinuses and teeth, but we insist on a thorough physical examination before we consent to operate, and even then we sometimes fail, and too often, when we do fail, it is because we let our sympathies get the better of our judgment. But the patient had everything to gain and nothing to lose, we argue with ourselves, and when we win in one of these cases, as we often do, how gratifying, both to ourselves and to the patient. I have in mind one of these cases—a lady 93 years old, who was blind and deaf; absolutely deaf. Her physical condition was fair. My better judgment said "don't operate," but my sympathies overcame my better judgment. I operated, and the gods being with us, we won. She got 20/20 vision and could read diamond print.

In the Orient, it is impossible to do this laboratory work in most of the clinics. The cases are literally "taken off the street," so to speak, and

*Read before the Sioux Valley Eye and Ear Academy, Sioux City, Iowa, January 24, 1933.

after a rather precursory examination are either passed for operation or rejected. In India particularly, trachoma with its complications and sequelae is pandemic, and from my observation I am of the opinion that its incidence is greater in percentage there than in Egypt. This also holds good for cataract. Egypt has a population of 15,000,000—India 320,000,000; therefore there is no place in the world today that offers to the ophthalmologist the opportunity for research and experience than does India.

It was my privilege during my six months sojourn there to work in several mission hospitals, six, to be exact. Some of these could scarcely be dignified by the name of hospital, but they served the purpose. I wished to perfect certain techniques, especially the intra-capsular, as done by the former Colonel Smith, of Amritsar, and his erstwhile pupil, MutraDas, of Moga-Tahsil. Although a high caste Hindu, the Doctor took me in as a brother, went to considerable trouble to teach me his technique; furnished my two sons and me with a car and chauffeur, when needed; entertained us in his home, where we broke bread together, and at the usual afternoon tea. The Doctor is a highly educated gentleman, and one of the cleverest operators it has been my privilege to observe. And above all, he is endowed with that broad wealth of human sympathy so necessary to a successful career in the profession. The Government had just completed for him a very beautiful operating pavilion, the year before I was there, where during the six or seven week fall and spring operating seasons, he and his assistants do between 6,000 and 7,000 cataracts. He lacked about 250 of having done 100,000 when I was with him. Doctors from all over the world visit his clinic and work with him. He never permits any one man to operate more than 10 daily. This because the reputation of his clinic must be kept at its present high standard. He informed me that his largest day's work was 254 cataracts, done at a roadside clinic. He does only 25 or 30 per cent intra-capsularly. Permit me to bespeak for the Doctor a most hearty welcome to this country, should he come, as he told me he planned to do, in a few years from that time. No doubt world conditions have also changed his plans, as they have ours.

Among the mission hospitals in India that are doing an excellent work is the Presbyterian Hospital at Mirage, in the Bombay Presidency. This hospital was established by Dr. Wm. Wanless, some 45 years ago. He not only won the confidence of the Indian people, but of the Government, as well, as evidenced by the fact that he was

knighted as Sir Wm. Wanless, in recognition of his services. The Doctor retired some few years ago, and has a home in Glendale, California, although I understand that he has since gone back to the field. When I was there, he was in the States, but his place was being most ably filled by Dr. Vail, who not only did hundreds of cataracts, but all types of major surgery as well, and his results were beautiful. This is the largest mission hospital in India.

The Methodist Mission Hospital at Brindaband, in the United Province, some 45 miles from Agra has for its Superintendent the charming and efficient Miss Porter. The surgeon in charge of the medical work is Miss Tower, and the volume and variety of the work she does is very great. While working at this hospital, I did, in the course of five weeks, with the assistance of the staff, some 700 eye operations, most of them cataracts. Because of the lack of personnel, it was impossible to keep an accurate record of the work—i. e. histories, end results, etc., in all of these cases, but going over them as accurately as possible, in the short time available before our departure, it was estimated that our percentage of failures was between 2 and 3%, Dr. Tower felt it to be nearer 2%. This small percentage of failures was perhaps not so much due to our skill as to natural immunity which these people seem to have acquired to their own infections.

The Minneonites maintain a rather large and efficient mission, at Dhantari, C. P. Their hospital is well arranged and equipped for the type of work they are called upon to do. Dr. George Troyer is in charge, and is ably assisted by Dr. Benson. At Sanka, some 20 miles from Dhantari, is a small branch of the mission, in charge of Dr. Friesen, who, with her versatile husband, carries on effectively and efficiently. Much of their work is with the lepers, although there is a rather large leprosarium only a few miles distant. The Doctor became quite proficient in doing cataracts at the time we were there. Our percentage of failures here rose somewhat, owing to some extra long chances we took in some rather hopelessly complicated cataracts, among some elderly widows, at one of their institutions. However, in a series of something over 1000 cataracts operated while in India, I can conservatively say that our failures did not run more than 4%. And again permit me to explain that I lay no claim to exceptional ability. These results were made possible by the excellent and hearty co-operation of the people with whom I worked, and to the natural immunity and co-operation of the patients themselves.

These people were among the most appreciative patients I have ever encountered. They were often destitute, mal nourished, dirty, uneducated, but seldom ignorant. They seemed to have an absolutely abiding faith in our ability to make them see—if we would only operate—no matter how hopelessly inoperative the case might be—an incident will illustrate.

We usually began work at 8 a. m. The court yard of the compound would contain many early arrivals, some who had traveled days by bullock cart, pony cart, on foot, and the more favored by train, and from then until noon the numbers constantly increased. We examined these cases, of course hurriedly, until we had passed for operation, from 25 to 50, depending somewhat upon the size of the waiting list. To secure this number, it was necessary to examine at least 50 to 150 cases. Those rejected were usually old staphylococci, leucomas, glaucomas, often with no light perception, active trachomas, phthisis bulbae, etc. It was often very difficult to convince these poor unfortunates that our reason for refusal to operate was not monetary. We finally struck upon this explanation, "Not for 1000 Rupees would we operate your case." This sum was as millions to you and me. This they usually seemed to grasp. In their simple reasoning, if one would not operate for this fabulous sum, it must indeed be hopeless. Yet they were not always convinced.

We were running three operating tables in our small operating room. The patients to be operated were squatting, as is their custom, jack-knife fashion, on the veranda, and perhaps a dozen were ranged around the walls of the operating room in like fashion. These dozen had had their eyes thoroughly irrigated with a 1/3000 bichloride solution, and were being anaesthetized in regular order, and as they were operated and taken from the room their places were taken by those on the veranda. We had operated table No. 1, then No. 2 and No. 3, and returned to No. 1, where the next patient lay draped and ready for operation. In this instance, on making the incision, I was astonished to see the lens leap some three inches into the air, and the ocular contents follow less precipitously; on careful questioning and investigation it was found that this patient had been examined no less than six times on as many preceding days and as often rejected as non-operative because of glaucoma and no light perception. But such was his child like faith that he was certain if we would only operate, he would see again. He had slipped in undetected among those passed for operation.

To accommodate these patients, it was neces-

sary to utilize every inch of available space—often including the courts. On one occasion we used as a supplemental hospital, a dispensary which had a court some 40x60 feet, partially surrounded by small rooms ten or twelve feet square; in these rooms, we would place three or four cots each, and by covering the court with tarpaulins, it would accommodate many more.

On one occasion, I missed a man on whom I had operated the day before. His cot was empty and the attendants seemed to know nothing of his whereabouts. Late that afternoon, he returned and explained that a man had owed him two rupees, which he had gone some three miles to collect. He had been taken in a bullock cart over cobblestone streets and dirt roads, where he had transacted his business, and Oriental business transactions, even when only a few annas are involved, are ceremonious, tedious and lengthy. I may add that the results in this case were very good, indeed.

It was interesting to note the type of patients who came for operation when we first began work at one of these hospitals. They were the outcasts, sweepers, temple widows and other depressed classes. Later, as results were obtainable, the Sadhus, Pundits, Priests, and other educated classes came; and many of these people were charming; often highly educated and frequently spoke fluent English. With some of these, I became well acquainted and enjoyed frequent and, to me, most instructive conversations. While they frankly admitted that they could, and do, profit greatly by our occidental civilization and their contacts with it, they were most emphatic that they wanted none of our philosophy or religion.

The practice of "couching" cataracts is still sometimes practiced by their local Indian doctors, who have had no medical education. Their results can easily be imagined.

It is interesting to make comparisons. Here, we have every convenience; better educated patients; usually better physical fitness—better sanitation; a common language, hence better co-operation; modern hospitals; trained nurses; assistants; etc. We can, and do, hold our patients longer in the hospital. We follow up our cases over longer periods of time. Our people, at least in the past, have not had the economic worries. In fact, every element which makes for successful results is ours. Yet, I find in checking over several hundred cases, operated since my return, that my failures run only slightly lower than in the Orient.

In conclusion, permit me to suggest that for

the ophthalmologist who has had sufficient training and experience, is philanthropically inclined, willing to undergo inconveniences and sacrifice considerable time and money, in return for which he receives a world of valuable experiences and the satisfaction of knowing that he has, in a small way, contributed to the comfort and usefulness of these unfortunate people, India offers, through her various eye clinics and missions, a Paradise par excellent.

PAROXYSMAL PREMATURE VENTRICULAR CONTRACTIONS INDUCED BY SWALLOWING: CASE REPORT

(Continued from Page 298)

he had been on 10 minims of tincture of belladonna t. i. d., which was continued another six weeks. He was free from symptoms until May 15, 1928, when an operation for acute appendicitis was performed. The pathologist reported an acute appendix with plastic exudate. On June 29, 1928, he had a gall bladder attack, and a cholecystectomy was performed. The gall bladder contained three pea-sized mulberry stones; the walls were tightly distended with bile and acutely inflamed. The symptoms again returned for a period of ten days. Electrocardiographic tracings were taken with the same results as heretofore.

The family history in this case was negative. He had had scarlet fever and tonsillitis as a child, a tonsillectomy having been performed at six years of age. Physically he was well developed and well nourished. The pupils reacted normally. There were tonsillar tags present, the left pole containing liquid pus. There were no devitalized teeth. The abdomen was negative. The urinalysis was negative. The transverse diameter of the heart was increased, measuring 17 centimeters in a six foot plate. The blood pressure was 122 systolic and 84 diastolic, and the pulse was 80. The blood Wassermann was negative; the hemoglobin was 74 per cent; the erythrocytes, 4,350,000; and the leucocytes, 4,500.

An attempt was made to determine which portion of the swallowing act was the causative factor in inducing the extrasystoles, but we were successful in determining only that the paroxysms of extrasystoles did not continue during the entire swallowing act. The electrocardiogram showed the showers of premature beats as lasting approximately two seconds, while according

to Kirke⁶, the time of swallowing lasts at least six seconds distributed in the pharyngo-oesophageal passages as follows:

1. Contraction of myo-hyoids and constriction of pharynx	0.3 Sec.
2. Contraction of first part of oesophagus	0.9 Sec.
3. Contraction of second part of oesophagus	1.8 Sec.
4. Contraction of third part of oesophagus	3.0 Sec.
Total	6.0 Sec.

The swallowing time may be increased but not decreased, since if a second attempt be made to swallow before the six seconds have elapsed, the remainder of the first act is inhibited; and the contraction reaches the stomach six seconds after the commencement of the second act⁶.

Since it was determined quite carefully by watching the camera that the electrocardiograph began to show irregularity just at the time that the larynx was felt to rise, and since the showers of extrasystoles were less than six seconds; we are inclined to feel that it was the first part of the act of deglutition that initiated the paroxysm. On the other hand the report of Rivers and Bueermann² shows by roentgenograms that cardiospasm and cardiac disturbance may occur concurrently. It would seem, therefore, that any part of the swallowing act may be associated with cardiac irregularity.

Quinidine was tried as a therapeutic agent but without relief. Digitalis and strychnine made it worse. During the past four years the condition has recurred several times for a period of two to four months each.

To summarize, a case is reported of a man in whom showers of extrasystoles were precipitated during swallowing. They seem to be of reflex vagus origin. To substantiate this theory of vagus reflex origin, cases of heart block of vagus origin are cited in patients with organic heart disease. The action obtained then seems to be one of reflex stimulation of the vagus branch to the heart which may occur in the functionally disturbed heart without organic disease in the form of extrasystoles but which occurs in the heart with organic disease mostly in the form of heart block.

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Necrotic Gingivitis

Elmer S. Best, D.D.S.
Minneapolis

OF THE many oral disturbances that thrust themselves upon both the medical and dental professions, thereby forcibly creating an attitude of co-operation, is the disease known as "necrotic gingivitis" (Trench Mouth). Because of its devastating nature and increasing prevalence, a wider dissemination of knowledge concerning prevention and a larger understanding of the disease itself among members of both professions is urgently needed. Because of the danger of contagion of this disease and its injurious effects, it has been suggested from the public health point of view that each case be reported and steps be taken that the disease may be promptly and efficiently treated. This disease, for which we have some thirty synonyms, exhibits both general and local symptoms, both of which may be diagnosed as due to other conditions or diseases. Consequently, it is imperative that we acquaint ourselves with the signs and symptoms of necrotic gingivitis in order to minimize our diagnostic errors.

According to Box, in his monograph on necrotic gingivitis, the most obvious signs are the gingival lesions, the gums being red and often bleeding easily, with ulceration proceeding rapidly and forming well-defined margins which are sometimes mistaken for syphilis. The pellicle which is formed may be mistaken for diphtheria when found in the tonsillar region. Other local manifestations are a distinctive and peculiarly offensive odor, sudden onset, tenderness of the part, increased salivation, and other symptoms not quite so consistent. The general symptoms are malaise, temperature, accelerated pulse, pallor, depression and possibly other mental disturbances, also gastric disturbances such as flatulence, vomiting and possibly diarrhea or constipation. An exanthematous eruption resembling measles is sometimes observed.

This disease may be established both by contagion (eating utensils, towels, kissing, etc.) and by activation of the organism through the establishment of the necessary factors compatible with rapid growth. Inasmuch as the chief causative factors of this disease are anaerobic bacteria, areas protected from oxygen ariation are found to be the primary incubation zones. Areas such as the gingival flaps of the partially unerupted third

molars, palatal gingival areas of the upper central incisors and buccal gingival areas of the molars, together with the tonsils, often provide the adequate loci. The spirillum and fusiform bacilli causing the disease become activated in these primary incubation zones, enabling them to grow in less favorable zones. Such secondary zones as the gingival tissue of all the teeth, areas around poor dental restorations, periodontal pockets, etc. enable these activated anaerobic bacteria to exist. From these primary and secondary zones the bacteria may spread to the free oral surfaces resulting in a general stomatitis.

The treatment of necrotic gingivitis is concerned first with the elimination of the acute phase. The mouth must be irritated as little as possible at first, and under no condition should an oral prophylaxis be performed upon the first visit of the patient. Cases are on record where a prophylaxis has spread the condition from a single incubation zone to the whole mouth, resulting in an extremely acute case of Vincent's Stomatitis. The patient should be instructed in the special technique of brushing his teeth so as to avoid touching the gums or spreading the infection during the acute phase of the disease. One of the best methods of treating the acute phase is by the use of Churchill's Tincture of Iodine and Silver Nitrate in combination. This consists of first drying the part and then applying with slight compression pellets of cotton dipped in iodine. The application is aided in flowing into the crevices by means of slight air pressure. Cotton pellets carrying 35% silver nitrate are next applied to the same area, thus forming a whitish-yellow precipitate in the necrotic and ulcerated tissues. The patient may be instructed to use sodium perborate regularly as home as an aid in the treatment. Following a few treatments of the Iodine-Silver Nitrate, the teeth can be scaled and cleaned. Under the above treatment and with rigid adherence to the home care, a case can be cleared up in a very short period of time. Following the removal of Vincents, infected areas which can again become incubation zones, such as impacted third molars, overhanging fillings and crowns, etc., are eliminated. The above method should prove a valuable aid toward efficiently combating this troublesome disease.

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THE SOUTH DAKOTA CONVENTION

Due to the effective planning of the officers and the local committee at Huron, the fifty-second annual session of the South Dakota State Medical Association held on May 15 to 17, offered a most enjoyable and instructive program. Despite economic conditions, meaning the depression, the attendance from all sections was surprisingly good, the registration including ladies reaching 202, and all seemed well pleased both with the scientific presentations and the social entertainment.

Headline visitors were Dr. M. S. Henderson, who gave dry clinics covering a variety of orthopedic conditions and spoke formally in connection with his well known ideas concerning the surgical treatment of joint tuberculosis. Convincingly driving home his points in favor of proper operation as compared with the slower and less efficient conservative methods. Dr. J. C. Bloodgood, Clinical Professor of Surgery in Johns Hopkins University, Baltimore, discussed cancer both learnedly and entertainingly throughout the session. We may not agree with Bloodgood in all his premises but at least he is always interesting and his keen wit and personal charm won the hearts of everyone in his audiences.

South Dakota's great problem at the present time is to secure satisfactory legislation for the protection of its professional standards. The writer was extended the courtesy of attending all meetings of the House of Delegates and the Coun-

cil and he sensed a full recognition of the importance of the situation in the discussions which prevailed. The association has acted wisely in its choice of leaders and they are fully alive to their responsibilities. There can be no possible doubt as to the ultimate outcome, under all these circumstances.

G. C.

THE NEW GRADUATE

This month the incubation period will be over for many of our medical students and they will launch forth as full-fledged physicians, seeking a place in which to pursue their chosen calling.

They have eagerly looked forward to this day, and are "ready to go". They have qualified, and want to prove to a waiting world what they can do. Their vigor of youth is beautiful to behold; their optimism is sublime.

Shall we tell them then that the profession is overcrowded? Shall we tell them that times are hard and that the whole world is topsy turvy? No, a thousand times no! There will be problems for them to meet and solve; rebuffs, perplexities and disappointments they will encounter, but who can say that these will not be good and wholesome?

As we cherish the memory of those who inspired us in our study and early practice, we would now emulate their example of encouragement by extending helpful hands to all those who

trustingly look to us for guidance. Concerning one thing there can and must be no question, no misunderstanding, no disillusionment and that is their welcome by us.

A. E. H.

TELEPHONE DIRECTORY CLASSIFICATION

Every physician knows that the classified telephone directory is not a satisfactory guide by which to select a specialist. He also knows that the chief qualifications required for such classification is a request by the applicant and his willingness to pay.

Why then do some persist in this practice? Do they not see how easy it is to confuse them with non-members of the profession? Do they not realize too the reaction on the part of other members when these would refer patients but cannot find the names listed among those of their own? No one doing referred work can afford to antagonize these others whose mildest comment must be that it is "confoundedly annoying." No one can afford to ostracize himself by an implied aloofness from those that he would serve. Some carry double listings; they are "eye, ear, nose and throat specialists" in one place and "physicians and surgeons" in another. Is this really necessary?

Would it not be better if doctors of medicine were all listed together in alphabetical order and their individual specialties given after each name? It would make for clarity while serving the additional purpose of keeping the profession intact, a condition devoutly to be wished.

A. E. H.

ACROMEGALY

This interesting disease-complex was first described in detail and named by Pierre Marie in 1886.¹ In the years which have since elapsed a bibliography of approximately 1,500 titles has accumulated, including the important monographs of Sternberg² and Messedaglia³ and now, most opportunely, has appeared the comprehensive monograph of Atkinson⁴ in which all existing literature is reviewed and summarized and all known cases, 1,319 in all, collected and tabulated. From these, 265 cases which came to post-mortem examination are analyzed and a description of the eye conditions in 914 of the cases is given. Seventy-seven cases underwent operation and are listed in some detail.

The industry and tenacity of purpose of the author in getting together and presenting this

enormous amount of material from all obtainable sources is properly emphasized by Sir Arthur Keith in a most illuminating foreword in which he outlines some of his own well-known views. He began to study giantism and acromegaly twenty years ago in a hope of finding some clues to the machinery of human evolution and in this he was not disappointed. His deductions are too lengthy for quotation in full here but in brief he assumes two separate growth mechanisms, the one of normal or pathological type which governs normal development or the pathological conditions known as dwarfism and giantism; the other is the "mechanism of functional hypertrophism," induced by peripheral stimulation but "mediated somehow through the pituitary." Thus the overgrowth of the blacksmith and thus he accounts for the overgrowth in acromegaly, wherein the parts most used are the site of the greatest enlargement.

Atkinson deals quite extensively with the clinical phase. "A typical case of acromegaly," he states, "is easy to diagnose. The enlarged head, the protruding forehead and eyebrows, the enlarged tongue, the thick everted lower lip, the frequent association with exophthalmos, diabetes, cutaneous eruptions, especially molluscum fibrosum and the alterations of sight, make up a picture which cannot be mistaken for any other disease." The less marked cases may be confused, he notes, with cranium progeum, gigantism, Graves' disease, myxedema, Paget's disease, macrosomia, syringomyelia, and hypertrophic pulmonary osteoarthropathy.

From all the evidence in hand it may now be regarded as definitely settled that the disease is one primarily due to dysfunction of the anterior lobe of the pituitary; generally, but not always associated with demonstrable pathological change of various type in that structure. Further than that, in the present state of our knowledge, we cannot go far, as Keith again aptly remarks, "We shall understand the manifestations of acromegaly and allied disorders only when we have mastered the physiology of the pituitary. That consummation is still far distant."

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G. C.

 DR. JOHN W. BELL

In the death of Dr. John W. Bell, Minnesota has lost one of her oldest physicians, and a man beloved by all with whom he came in contact. For nearly twenty years he has had a struggle against ill health, but has borne it bravely and without complaint. The end of his struggle came on May 16. It was fortunate that his many friends in the Hennepin County Medical Society, and throughout the state, had learned that on March 18 of this year Dr. Bell had reached the age of eighty years, and friends in the medical profession took this opportunity to express to him by letters, by postal cards, and in many other ways, their appreciation for his service to medicine in Minnesota, and for the fine qualities of his character.

Mrs. Bell, to whom as Kate M. Jones, he was married on November 11, 1890, shared with him in this avalanche of tributes.

Reviewing with the utmost brevity that portion of his career of interest to the medical profession, we find that he was born in Butler County, Ohio, March 18, 1853. He graduated from the Ohio Medical College in Cincinnati in 1876, following this with a long period of preparation by postgraduate study in Germany, where at that time many of the leaders in medical thought and research held teaching posts. He began his medical career in Minneapolis in 1882, became professor of the Theory and Practice of Medicine at the Minnesota Hospital College in 1886, and was made Professor of Physical Diagnosis and Clinical Medicine at the Medical School of the University of Minnesota at its opening in 1888. He was made Professor Emeritus in 1916. Thus during the thirty most active years of his career he played a distinguished part in the training of the many men who passed through the school during that most brilliant period in its development.

He was visiting physician at Northwestern Hospital and consulting physician at Swedish, St. Marys and Asbury Hospitals. Although his counsel was widely sought he made no parade of his ability. Without lessening in any degree the force of his opinion his tactful and courteous consideration for a fellow physician made him an ideal consultant.

A Democrat in politics he served in the Minnesota State Senate from 1891 to 1895. He was appointed and re-appointed many times on the Minneapolis Charter Commission.

He was an honorary member of the Minnesota Society of Internal Medicine and had served as President of the Hennepin County Medical So-

ciety, of the Minnesota State Medical Association and the Minnesota Academy of Medicine. However, the service which undoubtedly gave him the greatest satisfaction was as the medical member of the Hennepin County Sanatorium Commission for a period of ten years from its inception until his resignation in 1919. On that Commission the value of his counsel was felt from the first and to him is due in very large measure the remarkable development of, and the sound medical policies characterizing, Glen Lake Sanatorium.

As evidence of the esteem in which Dr. Bell was held by his colleagues in Minneapolis, where he had practised for more than fifty years, we take the liberty of quoting from an appreciation written for his eightieth birthday, and printed in the Bulletin of the Hennepin County Medical Society, April 10, 1933.

"Those who have had the pleasure of reading William Macmichael's delightful account of 'The Gold-Headed Cane' will remember that this cane first appears in history in 1689, in the hands of Radcliffe, the great London physician, as he is attending a consultation at the illness of King William III. Radcliffe gave the cane to Mead and it passed on then to Askew, Pitcairn and Baillie, who died in 1823. It had thus become a sort of badge of office in succession to the great royal physicians and consultants of London. This cane rests now in a glass case in the Library of the College of Physicians of London, having been deposited in the new building of the College the day before its opening on June 25, 1825. If such a cane could be thought of as a symbol of leadership, and of profound regard on the part of the medical profession for its bearer, we would award it to our Dr. Bell as the royal physician and consultant of Minneapolis and of the state at large as well, and we leave him in possession of this tangible but no less real token of our confidence and esteem, which we hope he and Mrs. Bell may live long to enjoy."

S. M. W.

DR. EMIL S. GEIST

Dr. Emil S. Geist, a life-long resident of the Twin Cities and a nationally known orthopedic surgeon, died suddenly at his home in Minneapolis, on Sunday, May 14, 1933, of Coronary Sclerosis.

He was born in St. Paul, Minnesota, on May 9, 1878, the son of Mr. Emil Geist, well known jeweler of St. Paul.

Dr. Geist's preliminary education was received in the public schools of his native city and in the academic department of the University of Minne-

sota, where he was for three years a member of the class of 1899. After receiving his M.D. degree from the Medical School of the same university in 1900, he served his internship in St. Joseph's Hospital, St. Paul, and in 1901 went to Europe where he spent three years in the orthopedic clinics of Vienna, Breslau and Paris, fitting himself for the practice of the specialty in which he was destined to become so well-known.

Upon his return to Minneapolis in 1904, he began the practice of orthopedic surgery which he elevated to so high a plane in the Northwest. In 1911 he married Augusta O'Hage, daughter of one of St. Paul's pioneer surgeons. Three children, a son, Justus J. Geist, and two daughters, Anamarie and Louise, who with their mother, survive the doctor, blessed this union.

Dr. Geist was always active in the medical circles of Minneapolis and in 1925 the Hennepin County Medical Society recognized his services by electing him President. He was also a fellow of the American College of Surgeons and the Minnesota Academy of Medicine. He was a member of the American Medical Association and was for several years Secretary of the Orthopedic Section of that organization. He was also a member of the Minnesota State Medical Society, the American Orthopedic Association and the Minnesota Pathological Society, and of the University Club, the Elks' Club and the Minneapolis Club.

He entered the Medical Reserve Corps of the Army in 1915 and was commissioned Lieutenant. He was promoted to a Captaincy two years later

and was made a Major in 1918. During the war he conducted a school of orthopedic surgery at Fort Oglethorpe, Georgia, and after the close of the war opened a reconstruction hospital at Fort San Houston, Texas.

Dr. Geist was for many years affiliated with the University of Minnesota Medical College in the capacity of Associate Professor of Orthopedic Surgery and had at various times served as Chief of Staff in several of the city's leading hospitals. He repeatedly visited the orthopedic clinics in the great centers of America and Europe and was a frequent contributor to medical and surgical journals. Few men in the northwest were so widely known.

Dr. Geist was an able, conscientious surgeon, and a tactful, considerate and helpful consultant; a warm-hearted, kindly, broad-minded gentleman; a loving husband and father and steadfast friend. Endowed with a personality of unusual charm, "a nature sloping to the southern side," his sunny smile and hearty handclasp were ever a benediction, a never-failing source of confidence and hope to his patients and friends. In a word, Dr. Geist was one of those rare men who by natural right bore the coveted appellation, "the good physician."

He has withdrawn into the shadows with the full flush of his splendid manhood still upon him, and his native state mourns the loss of one of her noblest sons.

OTTO F. SCHUSSLER, M.D.

Proceedings Minnesota Academy of Medicine

Meeting of April 12, 1933

THE regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, April 12th, 1933. Dinner was served at 7 o'clock and the meeting was called to order at 8 p. m. by the President, Dr. C. D. Freeman. There were 54 members and one guest present.

The secretary read the minutes of the March meeting, and these were approved as read.

On ballot, Dr. Arthur E. Smith, of Minneapolis, was elected to Active membership in the Academy.

The Scientific Program was as follows:

Dr. F. R. Wright (Minneapolis) reported the following case of "Trichomonas Vaginalis in the Male Urethra."

This patient, a 47-year old man, was sent to me from Atwater, Minnesota, with a request for help regarding a urethral infection. The patient stated that within 24 hours after intercourse with his wife (he denies any transgressions of the moral law) he noticed a tickling sensation in his urethra and a discharge of what he said was pus. Examination of the patient showed the external meatus smeary and plugged with a drop of mucoid secretion. There was no redness about the meatus. Under the microscope this secretion, stained with methylene blue, contained a large number of epithelial cells and comparatively few pus cells. No gonococci were to be found. Urine was voided in two glasses: the first carried some shreds and was slightly hazy, the second was perfectly clear. He had been given a 5 percent argyrol solution by his family physician, which he had been using three or four times a day. The haziness in

the first urine was no more than could be accounted for by the over-enthusiastic use of the argyrol solution.

In talking with this patient, he told me that his wife had had a leucorrhœa for years. On questioning her she stated that they have been married twelve years and that she had this leucorrhœa before her marriage; that she had been to so many doctors and received so little benefit that she had given up hope of ever being any better. At present she says she has a marked vaginal discharge with a continuous uneasy sensation about her pelvis but that she has grown accustomed to this and pays no attention to it. She refused to submit to an examination.

I asked this man to return in three or four days without using any treatment in the meantime in order that he might get rid of any chemical irritation which might be present. At the same time I asked his wife to take a douche daily using two teaspoonsful or ordinary baking soda to the pint of the solution. He returned to the office after four days and his first remark was that his wife sent word that the douche had given her more relief than all the treatment she had taken. At this time his meatus was filled with a big drop of mucoid secretion which was carefully collected and sent to the laboratory. The urine was perfectly clear, but contained shreds. Laboratory report showed the presence of trichomonas vaginalis.

The interesting and remarkable thing is the fact that although this couple had been married twelve years and the leucorrhœa was present before marriage, this is the first time this man has had any urethral difficulty. Apparently the male urethra is not very susceptible to this infection.

Dr. S. E. Sweitzer (Minneapolis) read a paper entitled "Adequate Treatment of Syphilis." Lantern slides were shown. (To be published separately.)

SUMMARY

Treatment was outlined as given at the Minneapolis General Hospital where 396 new cases were seen last year.

The treatment of syphilis should be active and persistent and should continue for at least three years. The time factor is especially emphasized. The treatment should fit the patient and not the patient fit the treatment. Early and long-continued treatment is the only way to prevent cardiovascular, visceral and central nervous system syphilis. Long rest periods are never to be given.

DISCUSSION

Dr. PAUL O'LEARY (Rochester) (by invitation): Dr. Sweitzer has covered the field of the treatment of syphilis extensively and it will be possible in the discussion to mention only a few of the many points he made. I believe it is quite essential to re-emphasize the idea that the treatment of early syphilis is still a long-drawn-out procedure. Efforts at the rapid cure of syphilis by the so-called "abortive" measures have been quite unsuccessful in the majority of instances. In a study of a large

group of cases of acute syphilis which were treated and observed for several years, it was found that those individuals who had had as a minimum thirty injections of arsphenamine in conjunction with either bismuth or mercury showed the lowest incidence of failures. When the group was studied from the standpoint of the number of injections the patients had received, it was found that the smaller the number of injections of arsphenamine, the greater the incidence of relapse.

In a similar study it was found that the most satisfactory type of treatment, as far as clinical and serologic relapse is concerned, is the so-called continuous system, a treatment program by which the patient is continually under the influence of the arsphenamine and one of the metals for approximately one year. For example, an arsphenamine course of six to eight injections, given at five-day to weekly intervals, is immediately followed by a course of mercury or bismuth of approximately twice as many injections. The second course of arsphenamine is started before the bismuth or mercury is stopped. This continuous type of treatment is carried out until the patient has had a minimum of thirty injections of arsphenamine and approximately sixty of bismuth. The value of bismuth as compared with mercury was also emphasized in this study by the fact that in those patients who received the arsphenamine-bismuth course the relapses, both clinical and serologic, were just one-half those observed in patients who received an arsphenamine-mercury course. It seems definitely established now that bismuth has decided advantages over mercury but that it is inferior to the arsphenamines.

In a discussion of acute syphilis attention must again be called to the fact that neurosyphilis is an accompaniment of acute syphilis, although the neurosyphilis may not manifest itself clinically until many years after the infection has been acquired. In patients with acute syphilis in whom the Wassermann reverts to negative, only to remain negative but a short time before it relapses to positive while the patient is under treatment, the spinal fluid is as a rule positive. In other words, if a spinal fluid examination has not been done in a patient who has a serologic relapse while under treatment for acute syphilis, such an examination should be made and the treatment varied according to the report obtained.

Dr. Sweitzer made one point with which I must disagree, namely, that he had not seen individuals who had been treated for a period of three years and who had had a relapse. I not infrequently see individuals who have had sixty to seventy or more injections of arsphenamine and a corresponding amount of bismuth or mercury in whom the blood Wassermann and spinal fluid examination are persistently positive. The point to be determined in these cases is whether or not the drugs used are inefficient or whether the individual himself lacks a resistance to the disease. It is my own concept that the latter explanation is the more plausible of the two. This has been called to our attention repeatedly since the advent of malaria therapy. Following the introduction of the arsphenamines, the role which the resistance of the individual played in determining the

course of the syphilis was lost sight of, but now that we have used the drug for approximately a quarter of a century, the value of the resistance mechanism is again to be considered. It is apparent that some patients with syphilis continue to show evidence of progression in the disease in spite of the intensive administration of the arsenicals and bismuth or mercury. In the same individuals, the use of fever therapy results in a complete serologic reversal in a high percentage of cases. This leads me to the belief that fever therapy is not only the best form of treatment for parenchymatous neurosyphilis of parietic type, but even more important that it is a valuable prophylactic against the development of paresis when the arsphenamines and the metals have failed to control the disease. Since the electric devices for the production of fever have become more popular, the factor of the resistance of the individual patient as the significant item in the course of the disease is constantly before us. Accordingly, it is my suggestion that those patients, in whom the so-called specific remedies have been used intensively but in whom the spinal fluid serology has not reverted to negative, be given fever therapy before the disease has progressed too far. Reports in the literature, particularly from Europe, are re-emphasizing the fact that the measures now in vogue to stimulate the patient's resistance are actually more specific than are the so-called "specific" remedies themselves.

Dr. R. T. LAVAKE (Minneapolis): There are two gynecologic diagnostic pictures not mentioned here that I would like to bring out in discussion. The first, a massive edema of the vulva without obvious abrasion. I erred in the first case that I saw in my practice. A woman came in complaining of tremendous irritation around the external genitalia due, she said, to an iodine burn brought about by an attempt at abortion by a criminal abortionist. The external genitalia were swollen and gave the appearance of a possible chemical burn. She had a negative Wassermann and no glandular enlargement. I treated her in the hospital and discharged her when the irritation permitted. She later developed a rash and positive Wassermann and treatment was instituted by a syphilologist immediately. I have seen five or six similar lesions since then. In each instance the clinician did not suspect syphilis.

The second picture refers to lesions of the cervix uteri. Do not fail to make darkfield examination of suspicious lesions. I have found several primary lesions in this way. Do not operate, cauterize, or radiate any cervix until you have with reasonable assurance counted out the possibility of syphilis.

Dr. F. R. WRIGHT (Minneapolis): Dr. LaVake has spoken of the condition of the female genitals due to syphilis in which the tissues become thick and edematous, very much like elastic rubber. This is the condition described in German books as edema indurativum. The condition is also occasionally found in the male.

Regarding the treatment of acute syphilis in general this depends entirely on the stage of the syphilis when the patient is first seen. If you can make a positive diagnosis before he has any glandular enlargement in the groin, a certain amount of treatment would be ne-

cessary. If he comes with a positive Wassermann and palpable glands in one or both groins, a large amount of treatment would be necessary. If he presents general constitutional syphilis with an eruption on his body, then a still more prolonged treatment would be necessary. In the first case, a positive diagnosis before glandular enlargement and Wassermann, the Germans say that one course of neo-salvarsan is sufficient. They put a course of salvarsan as from five to seven grams given at four-day intervals; therefore, it would be from eight to twelve 0.6 gram doses. If the patient comes with glandular enlargement and with a positive Wassermann he should have two such courses given three months apart. If the patient comes with an eruption all over the body he should be treated at least two years. Wassermann should be made every ninety days on all of these cases until at least a period of three years after infection has elapsed.

In the ordinary course of untreated syphilis, clinical symptoms relapse every three months; therefore, the interval of rest between courses of treatment should not exceed three months.

One can accurately judge the age of clinical symptoms by the character of the symptoms presented. The disease relapses every three months; condylomata lata does not occur until the second relapse, approximately nine months after infection.

In regard to those cases known as Wassermann fast, Colonel Harrison, who had charge of the venereal work in the British Army during the World War and who is now in London, says that a person who has a Wassermann fast reaction should be given treatment continuously for two full years.

In giving provocative salvarsan as a test, one should not be satisfied with a single Wassermann. Blood should be taken four days after provocative doses and then at four or five day intervals for at least five or six weeks.

In 1900 I was in Vienna in Neuman's clinic of syphilis and dermatology. Professor Neuman used to teach that there were three types of syphilis. (This was in the days before the Wassermann or the discovery of spirochete.) (1) One which manifests itself with lesions on the skin. (2) Another which manifests itself later in gummata of the bones. (3) And one which develops late lesions of the nervous system.

Dr. C. D. FREEMAN (St. Paul): I wish to agree with Dr. O'Leary's criticism of Dr. Sweitzer's remark that he had never seen any late manifestations of syphilis in patients who had taken three years of treatment.

I am not going to discuss the ordinary treatment of syphilis because we agree more or less except as to details, and that is, and always will be, a matter of personal opinion.

There is a possibility and even a probability that our treatment plays little role in the prevention of some of the late manifestations of syphilis, especially paresis.

To digress a little from the title of the paper, I would like to call attention to an article in the American Journal of Syphilis by Dr. Leo Kanner. It is rather interesting and illuminating, because it explains the incidence of paresis from a different viewpoint. He states (as I

believe is generally accepted) that syphilis was brought to Europe by the sailors of Columbus from America and that syphilis first made its appearance in Europe about 1494 in Italy and Spain. That the big outbreak came at the time that Karl VIII of France invaded Italy—his army containing Spanish mercenaries. He shows that general paralysis is not equally distributed among the various nations and that this is not because of racial differences but on account of the time the nation became infected with syphilis. He argues that paresis does not appear to any extent in a nation for about two hundred years after that nation has become infected; that it gradually increases for the next two centuries, and then starts to decline.

In substantiation of these points, among others, he states that the places where syphilis started show the lowest incidence of paresis among the white nations; that on the African continent, except in countries bordering on the Mediterranean, paresis is almost unknown, while among his brothers—the American negro—it is very prevalent, the American negro having been infected much earlier. In China, paresis is less common than in America, but syphilis is more prevalent.

Among the North American Indians, he says that, after most careful inquiries, at most only eighteen cases are recorded in the last twenty years. They are, as far as we know, the first possessors of this plague, and among them paresis is on the decline although syphilis is prevalent.

I mention this just for the reason that it may have considerable merit and that our old theories of mental overstrain, alcoholism, etc., so common in the white race where paresis is also more common, may be explained by the theory advanced by Dr. Kanner.

DR. KENNETH BULKLEY (Minneapolis): The educational value of such pictures as shown us tonight by Dr. Sweitzer to characterize lesions of syphilis is great. Many years ago, over a period of some four or five years, I had occasion to see rather large numbers of cases of syphilis with my father, Dr. L. Duncan Bulkley, one of the first dermatologists and syphilologists in this country. In those days the Wasserman reaction had not been developed and I cannot help but feel that, due to lack of laboratory assistance and diagnosis, the powers of clinical observation in the older generation were far better than those of the present generation. Errors in diagnosis of syphilis are made today often because the individual clinician does not trust his own diagnostic ability but depends too much upon laboratory assistance. The point I wish to emphasize is simply that if one clinically is certain that a definite lesion is syphilis, that that case be treated as syphilis irrespective of what the laboratory says in regard to the diagnosis. In other words, I believe that clinical judgment based on experience always has a perfect right to argue with the laboratory on the question of diagnosis.

DR. H. E. MICHELSON (Minneapolis): The subject of syphilis is so large and lends itself to discussion so well that one might talk on most any phase of the subject. When an individual is infected with any disease, the first question that we ask is—what is the in-

fection, what type of terrain is it implanted in, and have we any specific treatment?

In syphilis we know that the spirochete is the infecter, and, in spite of the many manifestations, experimental syphilis has shown that the spirochete which causes all types is one and the same.

Why do we treat syphilis for such a long time? We must realize that the treatment is directed with the thought that, by keeping the individual under the influence of these drugs for a sufficiently long period of time, we are enabling him to combat successfully the disease. When we keep this in mind, we at once know that we have no index for knowing just how much chemical reinforcement one body needs to successfully overcome syphilis. Therefore, we must keep all bodies under the influence of the drugs for a length of time which experience has shown is sufficient to protect, and maybe cure, a very large percentage of people having syphilis.

In an acute infection for which we have specific treatment, such as diphtheria, we have fairly good guides for the amount of treatment necessary, but in syphilis the nature of the disease makes decision at any one time impossible.

There is no question but that the syphilographer of the pre-Wassermann days was a very astute diagnostician, but after all is said and done, the laboratory is essential for guiding us in the treatment of the disease.

We must also realize that the present-day treatment is a chemical and not a biological treatment and that after we have treated patients for two and a half to three years with chemicals, and we still have evidences of activity, the only thing we have to fall back on is malaria or a similar form of treatment. Hence, we may state that the first two to three years of treatment of early syphilis is chemical, and if decided results are not then obtained, we must turn to malaria therapy.

DR. F. C. RODDA (Minneapolis): I would like to ask Dr. Sweitzer a question. Given a case of congenital syphilis which has had a thorough treatment with neoarsphenamine, bismuth, and mercury inunction over a period of two years, with a persistent positive Wassermann, what do we have to offer as to prognosis and when should the treatment be terminated?

DR. SWEITZER (in closing): I will answer Dr. Rodda's question first. The best treatment of congenital syphilis is its prevention. A lot of them are hopeless right from the start. We try to treat the mother and prevent congenital syphilis. If you can get them early enough and they are not too overwhelmingly infected when treatment is started, you may get along amazingly well. If we have a patient who comes in and at the end of two years of treatment we find a positive Wassermann, usually that patient has not been started on treatment as an infant. We usually treat those for three years and then if they get along all right and their general health is good we let them go. We have had some of those who have a persistent positive Wassermann after years of treatment. It would be advisable to do a spinal on those before deciding to stop therapy.

In regard to Dr. O'Leary's discussion, I would say that my own experience has been that in cases that have early syphilis you will find a lot of them with positive findings and they will have spirochetes in the blood in the fourth or fifth week, long before the glands are involved. One doesn't know just where to stop. If you take one hundred patients, early cases, and say—give them so much treatment and their syphilis will be cured, you will find there will be a certain percentage that will not be cured. That is not so good.

To help Dr. Wright out, the condylomata cases I said were a syphilis of from six to nine months, and those early ones were untreated. Dr. Finger, of Vienna, gauged them by their size. Condylomata lata can come fairly early after syphilis. In cleanly patients we do not see those so much.

In regard to Dr. LaVake's remarks, this edema is well known and it is a rather startling thing to see. Ordinarily you can find the sclerosa on the inside of the labia. In regard to the chancre of the cervix, I did not say anything about that for I did not want to embarrass the gynecologists. They sometimes cut them out or treat them with radium and then, after they break out, decide that the patient has a chancre.

As to the question of how long one should treat these patients, I hope some day we will be able to tell just when these patients are cured. Someone mentioned that all cases were not cured at the end of three years. Most of those cases are the type called syphilis maligna precox. That is found in inferior soil, i. e., those individuals who do not have the resistance to throw off the infection. Dr. Freeman has had one case of that, but I did not mention it because it was not my case. When these cases do come in and do not get along so well, I usually interrupt the treatment and give malaria or shock therapy of some kind to develop the resistance of the patient, and then many of them will respond to anti-syphilitic treatment. Shock therapy is usually typhoid.

The treatment of syphilis is undertaken by so many men. The eye men see cases of iritis. It should be treated as a systemic disease and treated with the idea that you want to cure the patient. We treat syphilis with the idea of preventing the late sequelae. The earlier you can get the patient and the more energetic your treatment, the more successful you will be.

Dr. C. C. CHATTERTON (St. Paul) gave a talk and lantern slide demonstration on "Extra-Articular Fusion of the Hip."

Dr. A. H. BOUMAN (Minneapolis) read a paper entitled "Something about Iodine." (To be published separately.)

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. John H. Rishmiller, Minneapolis, recently returned from Florida, where he spent the winter months.

Dr. Elmer Hill, a Minnesota University graduate of 1931, has opened offices for general practice at Spring Valley, Minn.

Dr. F. P. Frisch, Willmar, Minn., has returned to his offices after spending several months in New York City at post graduate work.

Palisade, Minn., who have been without a doctor for many months, have secured the services of Dr. S. L. Cline, formerly located at Fullerton, Ky.

Dr. R. W. Pence is the new president of Trinity Hospital staff, Minot, N. D., Dr. K. F. Bascom, vice president, and Dr. P. J. Breslich, secretary.

Dr. R. L. Hankerson, a recent graduate of the University of Nebraska, will join Dr. Edwards as a partner in general practice at Madison Lake, Minn.

Offices of the South Dakota board of health have been moved from Waubay to Pierre, where they will occupy new quarters which are for their exclusive use.

Drs. W. J. Marshall and A. R. Kinter, Missoula, were the guest speakers at the last meeting of the Mount Power Medical Society held at Anaconda, Mont.

Hollandale, Minn., who have been without a doctor during the past three years have secured the services of Dr. J. S. Shrader, formerly of Springfield, Minn.

South Shore, S. D., would be pleased to have a practicing physician locate in their town and are holding out some good inducements to become a permanent resident.

Twenty nurses were graduated from the Abbott Hospital, Minneapolis, last month with Dr. R. T. LaVake, making the address and Dr. A. E. Wilcox, presenting the diplomas.

Dr. C. H. Mayo, Rochester, was one of the guest speakers at the annual meeting of the American Association for the Study of Goiter, held at Memphis, Tenn., last month.

The offices of all the physicians and surgeons of Fergus Falls, Minn., will be closed Saturday afternoons during the summer months. A good suggestion for other cities to follow.

Dr. Emil S. Geist, nationally known Minneapolis surgeon died suddenly on May 14 the result of a heart attack. A sketch of his active life, will be found on another page of this issue.

At the May meeting of the Southwestern Medical Society held at Luverne, Minn., Drs. Geoffrey Cottam, J. B. Gregg, and G. E. Vandemark, all of Sioux Falls, S. D., were present as guest speakers.

Dr. Frank C. Smith, Yankton, S. D., was recently trampled to death on his farm near that city by one of his thoroughbred bulls. Dr. Smith was 64 years of age and was well-known in that section of the state.

The North Dakota Health officers for the coming year, recently elected at the annual meeting held at Fargo, are, Dr. B. K. Kilbourne, president, Dr. E. G. Sasse, vice president, and Dr. A. A. Whittemore, secretary.

David Unskow, New York City, president and Joseph Ushkow, general manager, of the Intravenous Products Co. of America, will attend the meeting of the American Surgical Trade Association at Chicago this month.

The Eye, Ear, Nose and Throat Specialties held their annual meeting at Huron, S. D., last month and elected the following officers, Dr. J. A. Hoff, Yankton, president, Dr. C. E. Robbins, Pierre, vice president, and Dr. H. L. Saylor, Huron, secretary.

The annual meeting of the Redwood-Brown County Medical Society was recently held at New Ulm, Minn., and the following officers elected: Dr. Albert Fritsche, president, Dr. A. P. Goblirsch, vice president, Dr. Wm. A. Meierding, secretary.

Dr. Charles R. Drake, Minneapolis, was nominated as a member of the Board of Education at the recent primary election. The medical profession should see that his election is made a cer-

tainty, as he is in every way, well qualified to fill this position.

The Chicago Medical Society will have a special booth located in the Hall of Science building at the Century of Progress Exposition at Chicago, during the entire season where information will be gladly extended to all visiting members which includes the wives and daughters of all physicians.

Dr. W. F. Cantwell, International Falls, Minn., has been named a member of the State Athletic Commission, under the terms of the new Minnesota boxing law, all clubs are required to provide the services of a practicing physician, whose duty it shall be to make a physical examination of all boxers, professional or amateur, engaged to appear on each card, before they enter the ring.

The Womans Auxiliary held one of their interesting meetings during the session of The South Dakota Association meetings, and elected the following officers, Mrs. J. C. Ohlmacher, Vermillion, president, Mrs. T. H. Jennings, Hot Springs, president-elect, Mrs. J. C. Shirley, Huron, vice president, Mrs. J. F. D. Cook, Langford, secretary-treasurer, and Mrs. A. E. Johnson, Watertown, correspondent secretary.

The South Dakota State Medical Association elected the following officers for the coming year at their annual meeting held at Huron on May 15, and also decided on Mitchell as the next convention city. Dr. E. W. Jones, Mitchell, president, Dr. W. G. Magee, Watertown, president-elect, Dr. A. S. Rider, Flandrau, vice president and Dr. J. F. D. Cook, Langford, secretary and treasurer. New Councilors, Dr. C. E. Sherwood, Madison, Dr. J. C. Shirley, Huron, Dr. B. A. Bobb, Mitchell, and Dr. N. J. Nessa, Sioux Falls.

The Minnesota State Medical Association broadcasts weekly at 11:30 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 7—The Heart in Infections. June 14, Environmental Medicine. June 21, Cause of Anemia. June 28, Periodic Health Examination of Men.



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Typhoid in Chamberlain, South Dakota*

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De Smet, S. D.

ON DECEMBER 29th, our sanitary engineer was called to Chamberlain to investigate the water supply of the city. Considerable so-called influenza had prevailed in Chamberlain for sometime, and controversy existed as to whether there was any typhoid or not, but our State Laboratory on the 30th had reported 12 positive Widal's. Mr. Towne, the next day, took samples of water to Vermilion, and while there found that they had run a number of Widal's and had 15 more positives. This makes a total of 27 positive Widal's on the 31st day of December.

We arrived in Chamberlain on the afternoon of January 1st and found the condition as above stated. The seriousness of the situation had as yet not become apparent to the citizens. We called a meeting of the city council and commissioners the following morning and made an estimate that Chamberlain was confronted with an epidemic of 200 or more cases of typhoid fever. To effectively handle the situation we asked for a city police to see that isolation of the sick was carried out and chlorine supplied for the disinfection of excreta.

Part of the laboratory equipment at Vermilion was moved to Chamberlain. We brought an incubator from Waubay, and Doctor Hunter and technician arrived on January 2nd and began Widal's, analyzed water samples, cultured stool

*Read before the North Dakota Health Officers Association meeting, Bismarck, N. D., May 3, 1933.

specimens and specimens of blood for typhoid bacilli. Our sanitary engineer had been on the job since the 29th of December and on that date started an effective chlorination of the water. In a few days the diagnoses of typhoid were rapidly made and it was not long until great anxiety was manifest. We had predicted 200 cases of typhoid and after the end of the first week the seriousness of the situation had entirely gripped the people. Our principle job then was to assure them that the worst part of the epidemic was over and that this increase of new cases would not continue, and that everybody would not have typhoid fever.

Chamberlain is a city of 1,500 people, county seat of Brule County, located on the east bank of the Missouri River about 75 miles below Pierre. Here in the early day came the pioneer rancher. He drank the Missouri River water and at first did not contract the disease. The Indian tells stories of the purity of the water and even today citizens in Chamberlain vicinity insist the river water is safe and that they have been drinking it for 50 years.

Typhoid has been endemic in South Dakota as everywhere else. Our state has had about 200 cases of typhoid a year with an average of 20 deaths per year for the past 10 years.

On the 3rd day of January we began typhoid vaccination. The first two days we gave a number of inoculations equal to the entire well popula-

tion of Chamberlain. We vaccinated between 3,400 and 3,500 people and a sufficient number were vaccinated by physicians in adjoining towns using vaccine, supplied by the State Board of Health, to make a total of over 6,000 people.

The vaccination clinic which we established in the City Hall, and later had to move to the Court House to have more space, was policed and managed by the Ex-service men of Chamberlain. These men, from previous experience, knew the value of vaccination and were of much help to us. The city physicians vaccinated a number of people, but their time was so occupied in taking care of sick that they preferred to be relieved entirely of the work of vaccination.

An emergency pasteurization ordinance requiring the pasteurization of all milk was passed. All food handlers were immediately checked.

Chamberlain has a sanitarium of 60 beds, but this was not sufficient to meet the emergency. The City Hall was converted into an emergency hospital. The Reconstruction Finance Corporation was called in to help and the Red Cross furnished nursing service.

There are four physicians in Chamberlain, excellent hard working men, but they were driven beyond their capacity in attempting to take care of the many cases that were developing daily. Cases were not seen, frequently until sick a week or ten days. On the 31st day of December we had 27 cases of diagnosed typhoid. As soon as the shock of the catastrophe subsided we made histories of the various households and individual cases. We not only made records of the homes where typhoid existed, but as school was not in session, with the help of the school teachers, we made a canvass of every home in the city of Chamberlain and thus obtained an accurate and complete census. We included in this census all people who resided permanently in Chamberlain, also all people who were living in Chamberlain during the school year and attending school, and others who were temporary residents prior to and during this typhoid outbreak. The total population is 1,530.

We had 247 cases of typhoid in the city, and 35 cases were recorded from outside of the city limits, but included in the trade territory or traveling having stopped enroute.

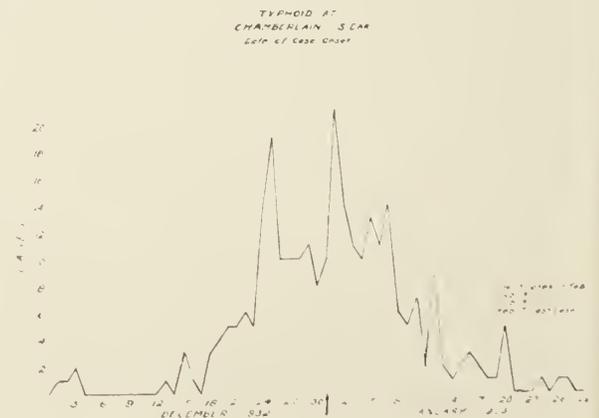
Figure No. 1 chart to show the incidence of typhoid cases. We attempted to trace the histories back in an endeavor to discover the first case. On November 7th a boy 17 years of age attending the Chamberlain High School, but home at Fort Thompson, reported to Doctor Goshorn, the Indian Agency Doctor, who made a

diagnosis of typhoid fever. A specimen of blood sent to the laboratory resulted in a report of a negative Widal, but positive for undulant fever. Another specimen should have been sent to the laboratory.

This boy died on the 25th day of November, and the doctor had made a report of undulant fever on account of the laboratory findings, but wrote across the report "this may be laboratory undulant fever, but it is clinical typhoid." This boy's mother was taken sick with typhoid on December 25th and died on January 16th. She lived at Fort Thompson, but frequently visited Chamberlain. We found two other cases in Chamberlain, exceedingly mild cases and were only diagnosed on stool culture. These two were also students attending the Chamberlain High School and had had the disease from the first part of November.

As we check our census records, we find that there was practically no period when there has not been typhoid in Chamberlain or vicinity. One hundred and twenty-four inhabitants of Chamberlain had had typhoid at some previous time, and two of these cases had their second attack at this time and four had had typhoid twice previously. A year ago 16 miles south of Chamberlain on the Missouri River one family had four cases of typhoid, and two of these were fatal. They used Missouri River water almost entirely. Last February a school teacher was reported to us as teaching school near the river and developed typhoid. This case was accredited to Chamberlain, but upon investigation we found that the school and the family where she boarded used Missouri River water entirely and that she had not recently been in Chamberlain. We also found two other families further down the river that had typhoid and they also used raw Missouri River water.

In 1914 a few miles west of Chamberlain there



were 27 cases of typhoid fever, all living near a certain draw and using dam water. This was rather a mild epidemic and no fatalities occurred. Before the whites polluted the Missouri it may have been safe drinking water, but for many years our records show that the Missouri River water has been contaminated with the colin bacillus.

There were 247 cases in Chamberlain and 35 living outside who contracted typhoid. In the city we had 20 deaths, and nine deaths resulted from cases living outside of Chamberlain, a total mortality of 29. Among those included in the outside are those who lived in the territory tributary to Chamberlain or temporarily stopped in the city.

We had the highest incidence of disease among the children of school age. This may be accounted by in part that the school house is a long distance from the pumping plant and at the end of a water main. We had no cases in children under one year of age, but during the first year we had two cases, the second three, the third year six, the fourth year seven, and the fifth year seven, making a total of 25 patients under six years of age or 17 per cent of the population. From six to ten years we had 56 cases or 37.8 per cent, 11 to 15—29.8 per cent, 16 to 20—21.8 per cent, 21 to 25—18.8 per cent, 26 to 30—12.9 per cent, 31 to 35—13.5 per cent, 36 to 40—7.3 per cent, 41 to 45—7.7 per cent, 46 to 50—5 per cent, 51 to 55—5.5 per cent, 56 to 60—2 per cent, 61 to 65—6 per cent, 66 to 70—2.7 per cent, and 71 plus 2.6 per cent. There was a slightly higher percentage of females than males.

The chart shows the highest incidence came at six to ten years, 37.8 per cent, and the next was in the four year group where we had seven cases out of 19, or 27 per cent—the first five years

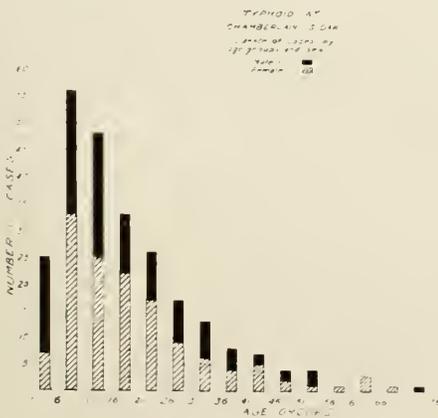
taken at a whole we had a total of 25 cases or 17 per cent. Our table shows the school age group as having the highest incidence of typhoid. As we advance in years the chances of getting typhoid gradually decreases due to vaccination, previous attacks of typhoid fever or a development of a natural immunity.

Worthy of note may be the fact that we had but two cases of typhoid fever among the 60 ex-service men in Chamberlain and one outside of the city of Chamberlain. Of these three ex-service men having typhoid one was in bed one day and the second one had a fever but one day, but stayed in bed several days and this case would not have been diagnosed had we not found a positive stool. The third man ran a very light course and would not have been confined to bed very long had it not been for rheumatism to which he is subject. Two of these men were vaccinated on the Mexican Border, received one shot of Lipo vaccine, while the third does not know whether he had one or more inoculations.

Only a small percentage of those who received typhoid immunization developed the disease and from the prevalence of the infection it is reasonable to believe that a number of those vaccinated must have been infected and the vaccination prevented the development of disease. At first we hesitated to give typhoid vaccination to those having an elevation of temperature, but after a few days we vaccinated all who presented themselves for vaccination and we believe the inoculations had a beneficial effect in ameliorating the disease if it did not prevent.

We have inferred entirely through this discussion that the infection was water-borne. The fact that nearly everyone in the vicinity of Chamberlain who developed typhoid had frequently visited Chamberlain augments in favor of a local source of infection. The water in the city of Chamberlain was not satisfactory. For a period of many years examinations have shown sewage contamination. A road construction crew working eight miles north of Chamberlain had been using well water until December 10th when they hauled water from Chamberlain and their water supply was restricted entirely to this supply for the month of December, and four men in this crew developed typhoid and two of these developing typhoid on December 20th and 24th died. Typhoid also developed in two families who had recently filled their cisterns with city water.

Just above Chamberlain a half a mile is an Indian School where live 84 Indian children and employees. We checked these for Widal and found eight per cent positive Widal's. There had been



no cases of typhoid in the school at any time. One employee of the school had had typhoid several years previously. He gave a positive Widal—we obtained from him an organism which has not as yet definitely proven to be typhoid—it may be a paratyphoid. We are still of the opinion that this boy is a carrier. The others who showed positive Widals were children whose stools were negative.

Twenty-five miles above dumping raw sewage into the Missouri River is Fort Thompson, a village of probably 250 people, and 75 miles above Chamberlain is the city of Fort Pierre which also runs untreated sewage into the Missouri. A considerable distance above that we have Cheyenne Agency and Mobridge. Ice might carry typhoid bacilli a long ways.

The Indian School above mentioned received its water supply directly from the Missouri River and uses raw water. At this school the water is pumped out of the river about once a week and settles in a settling basin sometime before being pumped into a supply tank. When the water is allowed to settle for a sufficient period of time the water is practically free from sediment. The city of Chamberlain has a similar system. Water is pumped from the Missouri River into two large settling tanks, but the time allowed for settling is often not sufficient to take out most of the sediments and consequently the mains of Chamberlain are about half filled with deposits. On December 9th the settling basins froze over and their use was discontinued. Raw water was pumped from the Missouri River into the city mains. Just above the intake of the city water supply is the outlet of the sewer from the Indian School. The fact that the Indian School did not have any cases of typhoid may be accounted for in the extra settling permitted before using the water, the fact that it is above Chamberlain and also Indians appear to be less susceptible to typhoid than the white race.

We see here that Chamberlain had had typhoid endemic practically every since white man settled the country. A few cases occurred the earlier part of December. These were unrec-

ognized and were not diagnosed until the epidemic was in full swing. We had but 27 cases diagnosed on the 31st day of December. From the histories we find that the occurrence of cases began an upward grade about the 12th of December and reached 19 cases on December 25th and on January 1st we had 21 new cases.

Adequate chlorination was started on the 29th day of December. Boiling of all water for drinking purposes was advocated from that day. Vaccination was started on the 3rd of January. All milk was pasteurized on and after January 7th. Here we have a practical cessation of primary cases two weeks after adequate chlorination was started. Three pounds of chlorine had been used per day, but with a great amount of sediment in the water it appears this was dissipated and was of very little benefit.

Chlorination was doubled and quadrupled, still no free chlorine could be obtained any great distance from the pumping plant. Not until 30 pounds per day was used did free chlorine appear in all places in the water distribution system. The dead ends were flushed daily so as to remove as rapidly as possible the contaminated water. The fact that a few cases occurred quite a while after chlorination was effective and vaccination had been started is probably due to the fact that the extreme period of incubation is as much as 40 days. A patient living north of Kimball who was called for jury duty on the 14th of December was in Chamberlain for two days and developed typhoid fever on the 19th of January. This gives an incubation period of 35 days. We checked this man and are satisfied the only time he drank infected water was on the 14th and 15th of December. All the rest of the time he lived on a farm where well water was being used.

Much appreciation was shown the State Board of Health for the effective way in which the epidemic was terminated. Chamberlain co-operated with us to the fullest extent. May the day soon come when communities will give us credit for helping save them from the catastrophies rather than helping clean up such conditions after they occur.



Fractures of the Jaws*

PART I. FRACTURES OF THE MANDIBLE

FRACTURES of the jaws are by no means infrequent. Statistics compiled a decade or two ago from several large series of fractures showed that fractures of the mandible constituted from four to seven per cent of all fractures of bones. These percentages estimated from the records of large general hospitals and clinics would now seem to be too low, for at that time fist blows accounted for approximately fifty per cent of fractures of the jaws.

The automobile, with its hazards, has greatly increased the incidence of fractures of the mandible and maxilla in private practice. This is particularly true of fractures of the upper jaw. Ten or fifteen years ago, fractures of the maxilla were quite rare, being outnumbered by fractures of the mandible fifteen or twenty to one. The character of present-day motor injuries, due to the sudden impact of the passenger's face against the instrument board or the back of the driver's seat and the driver's forcible contact with the steering wheel, has so increased the frequency of fractures of the upper jaw alone or in combination with the mandible that in my experience they are found about once to every four or five fractures of the lower jaw.

Motor accidents have also greatly increased the frequency of multiple injuries; and it is not uncommon to find fractures of the jaws and facial bones present in patients with fractures of the extremities, spine, or skull. These and other internal injuries may necessitate lengthy hospitalization. In such cases, active treatment of the jaw injuries must necessarily be postponed until such time as the patient's general condition will permit. In the meantime, supporting the jaws by bandaging and carrying out oral hygienic measures will aid in controlling infection and will minimize discomfort. In brain injury cases, accompanied by unconsciousness or delirium, and in severe cases of systemic injuries, it may be necessary to continue such palliative treatment for days

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or weeks before it is possible to immobilize the fracture in a satisfactory manner.

FRACTURES OF THE MANDIBLE

The general principles of treatment of fractures should be observed in the care of fractures of the lower jaw. The objectives are, of course, complete bony union, and the anatomical and functional restoration of the parts. The importance of the masticatory function and facial contour warrants expert treatment of these fractures. Far too often efficient treatment is not afforded these patients and complications ensue which result in delayed union or deformity. Unlike the majority of

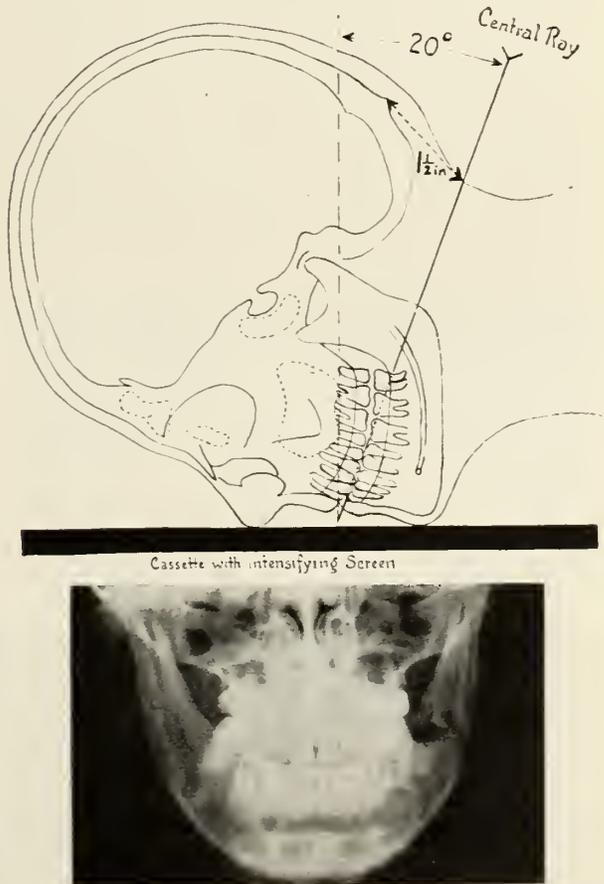


FIGURE 1

X-ray Technic for Postero-anterior (P. A.)—Examination of the jaws and malar bone. This film position and central ray projection is the most useful for a general survey in cases of jaw and facial injuries.

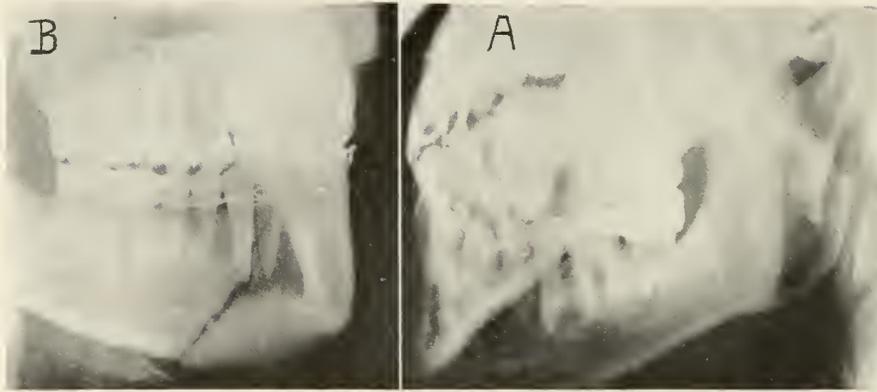


FIGURE 2
Lateral Extra-oral Jaw Films—(A) Ramus position showing fracture of the base of the condyle. This projection shows the angle, ramus and condyle and in addition usually shows the body of the mandible as far forward as the cuspid tooth. This is the most useful of three lateral extra-oral film projections. (B) Lateral film for the body of the mandible, fracture in the cuspid region. This gives good definition from the incisor region to the angle.

fractures of long bones, most fractures of the mandible are compound fractures. This is due to the fact that about eighty per cent are situated in front of the third molar region and the angle of the jaw, and consequently communicate with the oral cavity. This predisposes the line of fracture to infection from the mouth. Pyorrhea of the gum about a tooth in the line of fracture or root-end infection increases the likelihood of bone infection.

The knowledge gained from researches of the past few years in the repair of bone and the breaking strength of healing bone fractures should impress one with the importance of early immobilization of the fractured parts, and the need for continued immobilization for at least one month. The early fixation of a compound fracture of the lower jaw is our most efficient means of preventing, eliminating, or reducing infection of the line of fracture.

The repair of fractures is aided by a balanced diet with adequate mineral content, the utilization of which may be enhanced by the administration of cod liver oil or viosterol.

Fractures of the mandible may present but slight displacement and practically no mobility, or the displacement may be extreme

with marked mobility. In other cases, displacement may be slight or absent, yet manipulation may demonstrate free mobility. It would seem quite obvious that these compound fractures, with the ever-present danger of bacterial contamination from the mouth, should receive early and prompt attention. But all too frequently those showing but slight tendency to displacement are left untreated, and consequently with each movement of the mandible the nobility and slight separation of the fracture line permit irritation and infection of the bone. It should, therefore, be the rule that fractures of the lower jaw should be immobilized as early as possible, unless there are very good reasons for delay in doing so. The diagnosis of the number of fractures, the sites, displacements, etc., is made by visual examination, manipulation, and the X-ray. A study of the occlusion of the teeth affords the greatest information regarding the position of the lines of fracture. Not infrequently a fracture in the anterior portion of the mandible is apparent; yet it may be found to be quite impossible to manipulate the teeth into normal occlusion. It will be found that the molars of one or the other side come into occlusion with the upper teeth be-



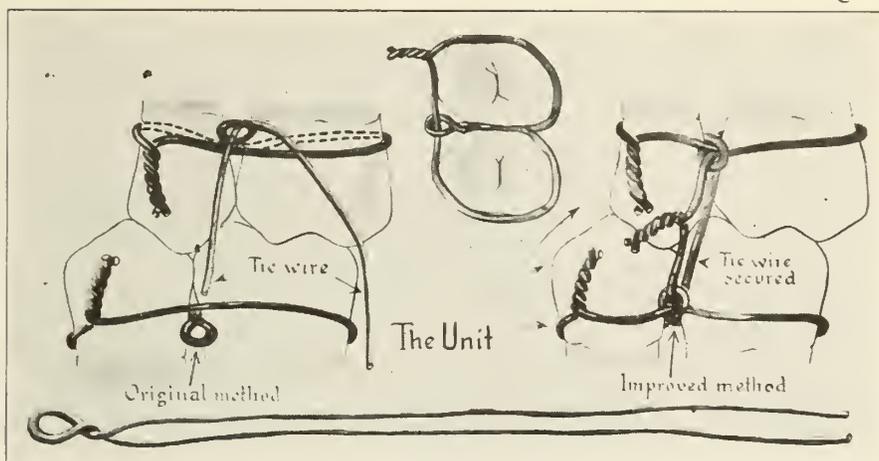
FIGURE 3

Direct Dental Fixation
The various types of splints that have been found useful in Class I fractures with teeth on either side of the line of fracture. Direct dental fixation alone is but occasionally indicated.

Direct Dental Fixation

FIGURE 4

Twisted Loop or Eyelet Wiring—This is a most useful method of wiring the teeth in occlusion. In order to apply the units there must be sufficient occluding mandibular and maxillary teeth, and the two adjoining teeth must have normal contact with the interproximal space large enough to permit the passage of double wires, No. 24 or 26 gauge soft brass wire is cut in six inch lengths. These are folded in the middle and two turns made to form a small loop.



fore the incisors occlude. In such cases the X-ray will usually show fractures of one or both ascending rami with over-riding.

THE X-RAY EXAMINATION

The routine X-ray examination should consist of a P. A. (postero-anterior) view of the facial bones and one or two lateral jaw films.

The P. A. (Figure 1) gives an excellent survey of both upper and lower jaws. Three lateral jaw film positions are described for: (1) the body, (2) the angle, and (3) the ramus of the mandible, respectively (Figure 2.) The ramus position is perhaps the most universal to use as a routine, in that it shows the body of the mandible as far forward as the cuspid tooth, in addition to the ramus, the condyle, and the coronoid process. These two standard film positions, the P. A. and lateral jaw, should suffice for most cases of fracture of the mandible.

In many fractures of the mandible involving teeth it is desirable to have a small dental film taken showing the affected area, because this film will give better detail of the line of fracture and its relation to the roots of the adjoining teeth. It will also show the presence of fractures of the roots, fractures of the process, the presence of small foreign bodies, etc., with more exact detail than is usually evident in the lateral jaw film. At times other films are of great service; for instance, the fourth extra-oral lateral position will show the region of the symphysis. For this same region occlusal films (3"x2¼") are frequently useful. These may be taken in two positions which will either project all of the teeth directly over the body of the mandible or show the symphysis region with the crowns of the incisor teeth projected forward. These films

are held between the upper and lower teeth, and the rays are directed below the chin and through the chin respectively. For the symphysis a film placed beneath the chin may be of service. A lateral film may be useful to show the direction of the bucco-lingual lines of the fracture in the bicuspid and molar region.

At times exposure for the temporomandibular articulation may be indicated for fractures of the condyle in the region of the joint (Mastoid Position). These various X-ray positions are fully described in an Eastman Kodak Company booklet, "X-rays in Dentistry, 1932."



FIGURE 5

Combined Direct and Indirect Fixation—Composite cast metal splint of the type used in war service showing interlocking devices.

TREATMENT OF FRACTURES OF THE MANDIBLE

There are two general methods used for the immobilization of a fracture of the mandible: (1) *Direct dental fixation*, by which the parts are held in correct relation to each other by splints or other appliances, and (2) *Indirect dental fixation*, by which the teeth in each fractured section are held in correct relation to the opposing upper teeth. The upper jaw thus becomes, in effect, a splint. Direct and indirect dental fixation may be usefully combined in many cases.

Direct dental fixation alone has a more limited usefulness and may be employed only in selected cases. It is indicated when the upper teeth are absent, or, if present, in cases where there is practically no mobility at the site of fracture and but little danger of infection, or where certain conditions make it absolutely necessary for the patient to be able to open and close his mouth. Useful methods of direct dental fixation are: (1) Half-round arch bars attached to the teeth on buccal or lingual surfaces by wires or orthodontia bands, (2) Hammond wire splint, (3) vulcanite, and (4) cast metal splints covering the teeth or made with open occlusion. (Figure 3.)

Indirect dental fixation by wiring the teeth of the lower jaw to those of the upper has proven to be a most effective and altogether satisfactory method of treating probably 90 per cent of cases of fractures of the lower jaw. Of the various methods of wiring, the

loop, or eyelet, method as recommended by Ivy is in my opinion the most useful. The unit of this wiring requires two adjoining teeth with a fairly normal contact and an interproximal space that will be sufficiently large to permit the passage of two wires. (Figure 4.) Tie wires from the lower to the upper loops secure the teeth in occlusion. It is a very stable and reliable fixation. In some cases the unit may be used in one part of the mouth but lack of a normal contact or a sufficiently large space or the presence of isolated teeth may necessitate the employment of methods of wiring used for individual teeth. A twisted loop wire may be passed twice around a tooth with one end of the wire passed through the loop on the second turn. Simple wiring, soldered loop wiring, or cutting of notches to make the wires secure on teeth that are later to be built up by a dental restoration or extracted may be efficient. Should these simple methods fail, it may be necessary to make bands with hooks or use adjustable orthodontia fracture bands with buttons.

In cases where teeth are few and far between half-round arch bars attached by means of wiring to the teeth of the mandible or the maxilla or both, may be necessary in order to hold such remaining teeth securely in correct occlusion. Hooks may be soldered to the arch bars. In the later stages of treatment these hooks make it possible to secure the teeth firmly in occlusion between meals and at

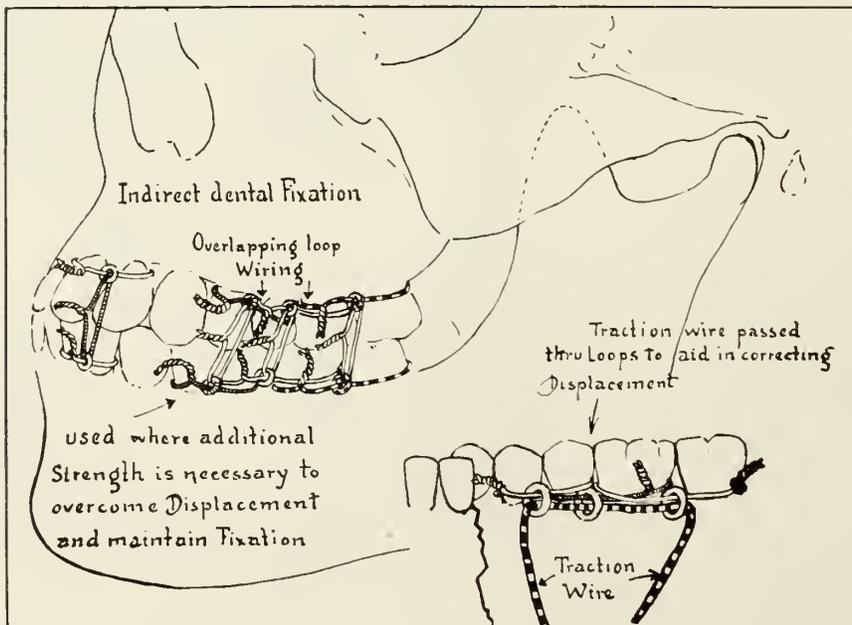


FIGURE 6

Indirect Dental Fixation—Showing the overlapping of twisted loop units to provide additional strength to correct displacement and maintain the fixation of teeth in occlusion. Insert showing the use of a traction wire passed through the loops for use in pulling the displaced fragment into normal position.

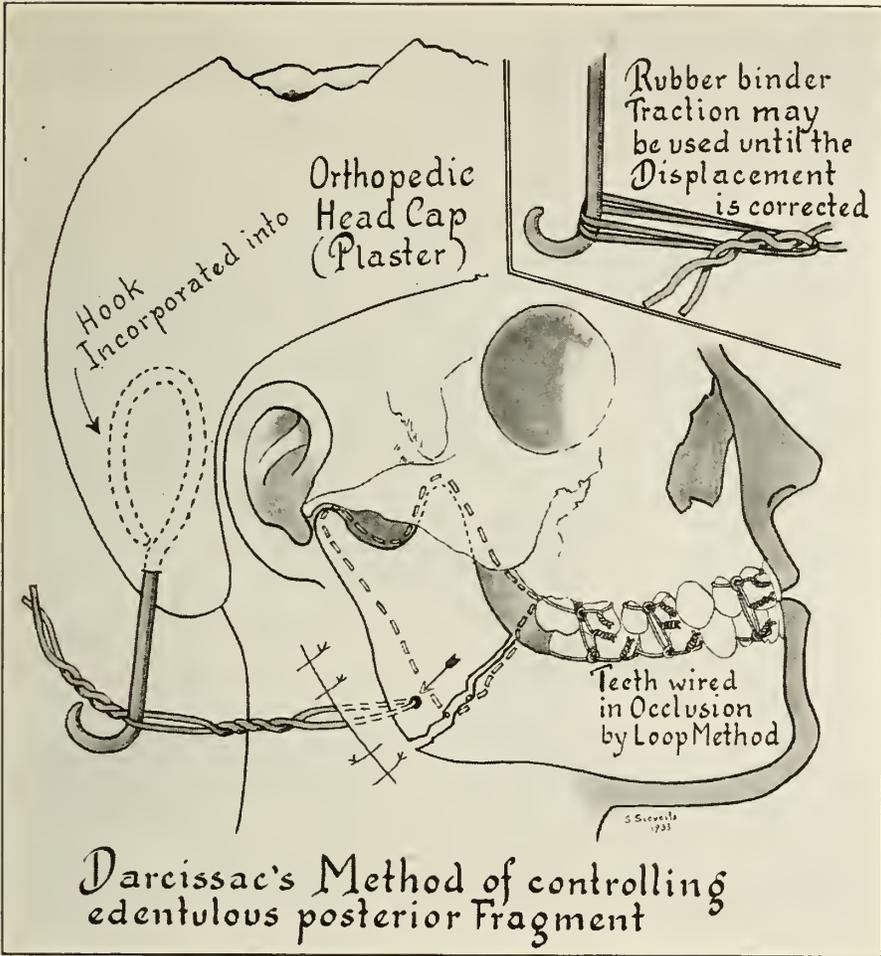


FIGURE 7

Darcissac's Method of Reducing the Upward Displacement and Controlling Posterior Fragments—This method is indicated in cases of edentulous posterior fragments with the fracture in the bicuspid region, in which the alveolar process ridge of the posterior fragment is pulled upward and cannot be held down by means of a bite block or splint without undue irritation and infection of the underlying tissues. It is also used in cases of fracture of the Angle or Ramus when the posterior fragment remains in a forward position after the teeth have been wired in occlusion and the elevator muscles put at rest.

night by means of rubber binders attached from hook to hook. By removing the binders at meal time the patient may open his mouth for the taking of soft food.

In cases where sufficient stability can not be obtained by the methods outlined, splints may be found necessary. Impressions must be taken of the upper and lower jaws and casts made upon which splints are designed and constructed. Formerly vulcanite denture material was largely used, but of late practically all of the splints are made of a silver alloy similar to coin silver. (Figure 5.) The cast splints are usually made in sections and then united by soldering. Hooks or buttons may be attached to the splints or various interlocking devices may be used. Splints may be wired to position, but cementation affords more security. The splint method of treatment of fractures was found to be the most useful in the war treatment. This was largely due to the fact that in most centers it was necessary to clear the patients to a con-

valescent hospital or send them on leave just as soon as the fractures were reduced and splints inserted in order to make room for new patients. The highly specialized organization of dental and laboratory services in jaw injury centers made possible the construction and insertion of splints in a much shorter period of time than is the case in civil practice.

In most cases the displacement of the mandible can be corrected without much difficulty, and in adults anesthesia is rarely necessary. In some cases pre-medication of the patient with such drugs as sodium amytol, nembutol or allonal, etc., may be helpful. Irritation of the mandibular nerve by movement at the line of fracture is the only painful part of the procedure; and one must, therefore, continually guard against any undue movement during the process of wiring. For a day or two following the accident there is frequently present a certain degree of traumatic anesthesia, which may permit the

reduction of the fracture and wiring of the teeth with practically no discomfort. It is frequently a good plan first to insert the wiring units on the teeth of the upper jaw, following which the teeth of the lower jaw are wired and the individual wires inserted from the lower to the upper loops to close the teeth in occlusion. It may be indicated to extract broken down teeth or roots, remove calculus, or treat the gum tissue before proceeding with the wiring.

General anesthesia should be avoided for two reasons: First, the post-operative struggling and nausea may result in severe strain upon the wiring or appliances or in actual displacement with deformity; second, pulmonary complications such as pneumonia or lung abscess may occur.

THE CORRECTION OF THE DISPLACEMENT OF FRAGMENTS

Certain displaced fragments may be quite resistant to replacement by manipulation. In such cases there are two methods that will usually be effective in reducing the displacement: (1) Overlapping units of loop wiring may be inserted on the teeth of the displaced fragment and through two or three adjoining loops No. 24 gauge brass wire can be inserted with both ends passing outside the mouth. (Figure 6.) These may be twisted three or four inches away from the face; and, by winding the twisted ends around a forceps, an assistant can exert traction while the operator is securing the distance so gained by tightening the inter-maxillary tie wires. It may be possible to gain only a portion of the distance at one time, in which case the traction wire is allowed to project from the mouth where it is held against the cheek with adhesive tape. A few hours later or the following day further traction is made and the tie wires tightened. By this time relaxation of the irritated and contracted muscles may permit final reduction and completion of the wiring. The extra-oral wire is then cut and removed. This method is most useful for displaced fractures of the body of the mandible of Class I, with teeth on both sides of the line of fracture, the displacement being more horizontal than vertical.

(2) The second method is the utilization of rubber binders attached to wiring units or arch bars to pull the displaced fragment towards the teeth in the upper jaw with which the teeth in the displaced fragment should

occlude. This method of gradually reducing displacement by continually tiring the spasmodic contracted muscles is more particularly indicated when the mal-occlusion is due to the over-riding of ramus fractures producing vertical displacement with open bite, combined with a lateral displacement resulting from a second fracture at the symphysis or the bicuspid region on the opposite side.

The fracture treatments already outlined will satisfactorily take care of most fractures of the body of the mandible where there are sound teeth on both sides of the line of fracture. (Class I.) In cases where there is a fracture in the bicuspid region with no teeth behind the fracture the alveolar process ridge of the posterior fragment may be held down by the use of a bite block of vulcanite or metal splint extensions from the lower or upper teeth, the remaining teeth being held in occlusion by wiring or splints. A previously worn partial plate may be used for this purpose.

In the event that such methods do not stabilize the edentulous fragment, Darcissac's method of controlling edentulous posterior fragment has been found most useful. (Figure 7.) An incision is made behind the angle of the jaw, through which the angle and posterior border of the ramus are uncovered and drilled through. A 22-gauge silver, bronze, or brass wire is passed through this hole, then twisted, and allowed to project several inches.

(Continued on Page 328)



FIGURE 8

Lateral jaw film, ramus position showing fracture of the lower jaw in the region of the third molar taken after the removal of the fractured mesial root. Inset—small dental film showing the fracture line to involve the mesial root which is fractured from the remainder of the tooth. The temporary retention of the crown and distal root of the tooth is indicated in order to prevent the upward displacement of the posterior fragment.

Post-Graduate Study in Vienna

Aaron Stolinsky, M.D.
Sheldon, N. D.

HISTORICAL SKETCH

VIENNA, once known as Vindomina, later on as Vindobona, was originally a Celtic settlement. In the first century A. D., during the reign of the Emperor Claudius, the Romans founded a permanent camp there which commanded the Danube. Now Vienna is the third city in population and the largest in area on the continent of Europe. It is located on the Danube with an arm of the river flowing directly through the city. It is a province in Austria and now holds a special position in relation to local government. Vienna has a population of nearly two millions.

Vienna has three treasures to which she proudly refers when attempting to establish a claim to distinction. They are her University, operas and concerts. The outstanding part of the University is undoubtedly her Medical School. The Viennese School of Medicine was founded in 1365. It has from the beginning of its history attracted reputable physicians, world-renowned scientists, serious students and trained investigators in every field of medicine and the healing arts. Its world-wide fame as a scientific and pre-eminent teaching center, dates from the middle of the Eighteenth Century and has been justly maintained, with only the intervening setback of the World War, up to the present day and hour. At the present time it ranks among the finest institutions of learning in the world and presents unrivalled opportunities for study and scientific research in many special branches of medicine.

In 1754, the Dutch Physician, Gerard van Swieten, inaugurated the first chartered medical clinic of Vienna, which was organized on the model of the famous sister institute at Leyden. The new clinic was soon to give a rapid and lasting impetus to therapeutic methods of that day and was the cradle from which arose many famous men in medicine. In 1784, three decades later, the clinic was transferred to the Wiener Allgemeines Krankenhaus (Vienna General Hospital) where it continued to forge ahead in scientific medical research and was soon leading the entire world in medical instruction. As early as this, prominent physicians from both

London and Philadelphia found it their duty to visit and study in Vienna. One can find a vivid description of it in Richard Bright's travel diary of 1814.

A FEW OUTSTANDING FIGURES

At the beginning of the 19th century, besides the work already done in the departments of Internal Medicine and Surgery, a sudden forward spurt in progress was made by BEER and JAEGER in the field of Ophthalmology. About the year 1845, the Viennese Medical School had reached a high pinnacle in its world fame as the greatest medical center. At that time, SKODA, the clinician, and ROKITANSKY, the pathologist, together brought about a complete revolution in the then prevailing conception of pathological processes and their clinical manifestations and methods of diagnosis. As the work of these two medical giants became known throughout the world, more and more physicians, students and investigators turned to the Vienna School of Medicine to see and learn the newly discovered means of diagnosis. Research, experiment and teaching were emphasized as never before in the history of medicine.

At this period HEBRA began work which was to lead to a total reformation in the field of Dermatology, scientific surgery, in the hands of Schuh, assumed an entirely new aspect. Anatomical research was extended by HYRTL. Then followed another group of brilliant men, including MEINERT, the brain anatomist, then the surgeon BILLRATH, and the clinicians BAMBERG, NOTHNAGEL, and NEUSSER. In 1847 an operation under ether anesthesia was performed, and a few months later SEMMELWEIS discovered the causation of puerperal sepsis. He completely verified and amplified the observation of OLIVER WENDELL HOLMES in his paper of 1843 on "Contagiousness of puerperal fever."

The development of specialization in medicine was progressing likewise, largely as a result of the teachings of Rokitansky and Skoda. CZERMACK devised the first laryngeal mirror. Otology developed rapidly under POLITZER, and laryngology under TUERCK developed into a distinct specialty; KRAFFT-EBING wrote a new page in psychiatry; FUCHS in ophthalmology;

KAPOSI in dermatology and BENEDICT in electrotherapy etc., counting down to the present day in the development of such special fields as Urology, Roentgenology, Electrocardiography, etc. Indeed, the electrocardiogram was invented in Vienna by Einthoven, as the X-ray was by Roentgen.

Among those of this generation who have and still do carry on these traditions and whose names have practically become household names wherever medicine is known and studied, it will be wise to name at least a few: the octogenarian, ADOLPH LORENZ, Professor of Orthopedics; the originator of Malaria-therapy and Nobel prize-winner, WAGNER-JAUREGG; the specialist in glandular therapy and rejuvenation, EUGEN STEINACH; the aural and brain specialist and famous teacher, ERICH RUTTIN; the nose and throat specialist, HAJEK; HOLZKNECHT the Roentgenologist, and SIGMUND FREUD, the founder of Psychoanalysis, which is doing so much to explain the mechanisms underlying mental disturbances and psychiatric pathology. To quote Harvey Cushing: "As a medical center, Vienna has had a remarkable career, and her influence particularly on American medicine has been very great. . . Austria may well be proud of what Vienna's school has done for the world, and she still maintains a great reputation. . ."

THE A. M. A. OF VIENNA

As more and more English-speaking students came to Vienna, a larger number of instructors fitted themselves to lecture in English. However, there was still a distinct need of some central organization for assisting English-speaking physicians in post-graduate work. In 1903, DR. RAVOLD of St. Louis organized the present American Medical Association of Vienna.

The American Medical Association of Vienna is unique in being the only organization of its kind in Europe. It is a society of English-speaking physicians of the first rank. Its avowed purpose is to facilitate and arrange study-courses in all branches and to contract with the most prominent physicians and specialists of the University of Vienna, securing exclusive priority of their services as instructors to American physicians and members of the organization.

All English-speaking physicians and graduates of reputable medical schools, who are of good standing in their respective communities, are eligible for membership in the American Medical Association of Vienna. The Association seeks to collaborate with the students, physicians and Viennese professors, selecting and arranging courses and planning schedules to meet the needs

of the individual. Thus any physician coming to Vienna a total stranger, unacquainted with the German language, may be informed as to the proper methods of procedure and the optional opportunities offered solely to members of the A. M. A. If his time in Vienna is curtailed, he may, upon the presentation of proper credentials, enroll at once in any one of the available courses.

During the period of the war, post-graduate work in Vienna was practically discontinued. But immediately after there was again an influx of post-graduate students. In 1921 the American Medical Association of Vienna was reorganized. Again the school was attracting wide attention and the last few years have seen a rapidly increasing number of physicians from all over the world coming to Vienna for study.

The life membership fee of the American Medical Association of Vienna is 15 dollars. The monthly dues of the Association, while studying in Vienna, are two dollars. Regular meetings of the organization are held every other week.

The Association began with a nucleus of 35 members and up to the end of 1932 the A. M. A. had 8,079 life members. For the last three years the membership of the organization was as follows: 1930, 694; 1931, 517; 1932, 420. The decrease in the number of doctors that come to Vienna for post-graduate work may definitely be ascribed to the world depression. Seventy-five per cent of the physicians registering during the past year were citizens of the United States. The remaining twenty-five per cent of the physicians were from British Isles, Canada, Australia, Egypt, South Africa, India, Palestine, China, Japan, the Philippines, Hawaii and Brazil. Thus the American Medical Association of Vienna is today a truly representative organization of English-speaking physicians from all parts of the world.

The A. M. A. maintains its own club rooms on Alserstrasse nine. There are also the office and library. The library has about 610 medical books and 62 medical journals and periodicals. The Woman's Auxiliary of the Association also has a general library with 420 books. At the time of writing this article, the association is considering a plan of moving its club rooms to more spacious and comfortable quarters.

COURSES OFFERED AND PRACTICAL OPPORTUNITIES FOR POST-GRADUATE WORK

At the present time there are more than 400 English courses being given for English-speaking physicians compared with 20 in 1903. Two hundred and eighty members of the faculty conduct courses in fluent English as compared with

two men in 1879. In 1931, 103 courses on different medical subjects were subscribed for, each lasting ten hours (ten hours may be taken as the average length of a course); 370 lecture-hours from three to six hour courses. These courses were given by 76 instructors (of those 63 were from the University teaching staff). One may get an idea of the money spent by doctors for post-graduate work from the following figures: in 1930 the A. M. A. paid out to the instructors for courses \$86,136.83; in 1931, \$74,042.60; in 1932, approximately \$59,600.

The American Medical Association of Vienna now has an agreement with the University of Vienna to the effect that no medical course in English may be given unless the physicians are members of the A. M. A. of Vienna. This agreement has been made not in order to monopolize the post-graduate work but to organize it further and to administer it efficiently. Physicians who come to Vienna for only a few days and wish to observe conditions are given guest memberships and their work is greatly facilitated by the organization of the association.

In the club rooms of the association there are many square yards of bulletin board completely covered with slips, each announcing the beginning of a new course and ready for signatures. Within a week or two one can see a great many new slips because the old ones have been signed in full and the courses are now under way. The duration of the courses vary, but ten hours, as I have stated above, seems to be the usual length.

The prevailing average fees are five and six dollars per hour for assistants and professors. This sum is pro-rated among those taking each course. For example: if a certain course costs \$5.00 per hour, lasts ten hours and is limited to ten members, then the professor gets \$50.00 for the course and each student of the ten pays only \$5.00. In many didactic courses more than ten students can register; in others, on the other hand, such as laboratory courses etc., the number may be limited to four-six or even less. In cadaver surgery two students usually sign up for five-ten hours, each having to pay \$2.50 per hour. In some specialties, such as eye, ear, nose and throat, gynecology and obstetrics, internal medicine, and dermatology new courses may begin practically daily, for others, more rare subjects, on the other hand, one may have to wait for some time. It all depends, of course, upon the number of doctors present at that time and upon the interest of a group in a certain course.

Vienna is especially known for its abundance in cadaver work because it is required by law that every patient who registers in a public hospital in Austria, especially in Vienna, should be autopsied in case of death. Sixty-one large clinics are available in the immediate vicinity of the association quarters and twenty-seven more distant hospitals are likewise used for instruction and observation.

One may get an idea of the size of the hospitals from the number of beds in the following hospitals: Allgemeines Krankenhaus, 2,935; Franz Joseph, 1,000; Elizabeth, 556; Orthopedic, 200; Sofien, 217; Wilhelminen, 1,331; Lainz, 1,217; Rainer, 600; Rudolph, 1,034 and Wieden, 574. Total beds available, 9,664.

Just across the street from the club is one corner of the Allgemeines Krankenhaus (General Hospital), out of which more medical wisdom has emanated than from any other single institution in the world. It is the largest hospital on the continent of Europe. The professors and instructors of the University write and teach exceptionally well. They have the advantage of an immense amount of material for practical teaching and demonstration. Austrian patients submit uncomplainingly to examinations because they have become accustomed to being used for instruction through generations of service as clinical material. At no time in history, to our knowledge, has any great medical center been so well equipped both from the standpoint of personnel and clinical material to give post-graduate instruction to foreign students. The Viennese are peculiarly fitted by training, temperament and tradition to teach scientifically and to perpetuate the science and art of diagnosis. The Viennese professor is a very high type of gentleman. He likes the American physician and often exhibits with pride a long list of the men he has taught from abroad. If by chance he visits America, he is met in almost every city by his former students who receive him with open arms.

COST OF STUDY AND LIVING EXPENSES

How much does one have to spend per month for post-graduate work in Vienna? This question is not easy to answer. As I have already outlined above, it depends entirely upon the number and the nature of individual courses that one wishes to take and also upon the number of doctors that are willing to take the same courses. From the writer's own experience and observations \$100 per month would be a conservative figure that the average doctor spends per month for graduate study in Vienna. Of course, there are doctors

(Continued on Page 330)

Controlling Tuberculosis Among Children*

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IN A CONFERENCE with your president, Mr. Henry C. Wright, your secretary, Dr. Charles Prest, and others, I was greatly pleased to learn of the plans of your organization to make a careful examination for tuberculosis of so many school children and to repeat these examinations periodically for five years.

After having spent the greater part of today observing the work which you have in progress, I am strongly convinced that you have undertaken a project which will come to be looked upon as one of the historical landmarks in the control of tuberculosis. I was particularly impressed with the visit to Glen Cove, where I was permitted to see the new rapid X-ray camera in process of construction. The value of the X-ray film in diagnosis of tuberculosis is definitely established. The demand for it must increase. The chief obstacles that have stood in the way of much greater use of the X-ray films in survey work have been the lack of appreciation of their great value, their cost, and the slowness with which they are now made ready for interpretation. Because of such obstacles, many workers who would like to see X-ray films of large numbers of school children and similar groups have been unable to use them and are now contemplating the use of the fluoroscope. Although this instrument reveals more evidence of certain types of disease than the physical examination, it is a much coarser screen for chest work than the X-ray film. For ten years I have been making comparisons between fluoroscopic findings and X-ray film findings of the same chests and have come to look upon the fluoroscopic examination as unreliable in the detection of certain types of pulmonary lesions which are often very significant.

My conference with Mr. A. J. Powers and Mr. Frank Powers concerning the production of paper X-ray films, as well as the rapid X-ray camera, was most illuminating. It seemed almost unbelievable that huge rolls of paper X-ray film, each with a capacity of more than a hundred chest exposures, could be so quickly and uniformly made ready for interpretation. On viewing developed paper films of the chest, under the

direction of Dr. Margaret Witter Barnard, I was amazed to see that practically all shadows visualized on transparent films were also easily visualized on paper films made of the same chest. With such a satisfactory beginning, I can see great future possibilities for the paper X-ray film, particularly since its cost is so low, and so little time is consumed in making exposures and preparing it for interpretation, as to make its use very practical.

We have entered upon a new day in tuberculosis control work. Many, in fact most, of our conceptions of tuberculosis have changed. Until recently our viewpoint concerning tuberculosis was somewhat fatalistic; now optimism prevails. This is largely due to the casting away of opinion and substituting facts. Since the report of some experimental work about 1843, and especially since the discovery of the tubercle bacillus in 1882, facts have accumulated until we now begin "to see through" tuberculosis. We know it is a germ disease; therefore, it is communicable; we know how tubercle bacilli are eliminated from the bodies of animals and persons suffering from the disease and serving as spreaders and carriers of tubercle bacilli; we know how these microorganisms are carried to the bodies of normal, healthy persons; we know the portals of entry; we know much about how after being admitted to the organs, such as those of respiration and digestion, they gain entrance to the tissues; we know much of the pathology which results; we know much of the hypersensitiveness which develops with the formation of tubercles, as manifested by the positive tuberculin reaction. At one time, and not so long ago, we determined whether an individual had tuberculosis by symptoms of illness, such as fever and loss of weight. We also in a very indirect manner examined the chest by looking at, feeling, and tapping over its surface. We listened for sounds which were transmitted through the chest wall, first with the naked ear applied to the surface of the chest; then with an instrument known as the stethoscope. We then examined with a microscope any suspected materials, such as sputum coughed from the lung, for the germs of tuberculosis. These methods of detecting the disease were the best

*Annual address presented before the joint meeting of the Queens County Medical Society and the Queensboro Tuberculosis and Health Association, New York, September 22, 1931.

we had; in fact, they aided us in the detection of large numbers of cases of tuberculosis but when we had detected them we found that the vast majority had such advanced disease that treatment was of little avail and worse than this for the community was the fact that they were spreading tubercle bacilli to their associates. Although we still use these methods of examination, and still find them valuable, we are coming to look upon some of them as rather crude methods. Refinements in diagnosis have been necessary. These have gradually been developed and although we do not have all that we desire, nevertheless the detection of tuberculosis has now been placed upon a scientific basis. The tuberculin test, so long thought to be of little or no avail because of the great prevalence of those who reacted positively, has been shown to be our finest screen in the detection of tuberculosis in the living body. While this test has its very definite limitations, it provides us with two very important facts; first, that the positive reactor has been exposed to tubercle bacilli; second, that they have gained entrance to the body and that they have set up foci of disease. The human body has great inherent resistance against tubercle bacilli, so great in fact, that when these microorganisms first gain entrance to the tissues and produce foci of tuberculosis, they are nearly always brought under control in a relatively short time. In many cases, this occurs so quickly, and such slight changes are made in the tissues, that we can not locate the area of disease during the lifetime of the individual. In others, these foci reach such proportions that they are easily detected by symptoms, physical signs, and laboratory examinations. An intermediate group, not detected by these methods of examination, may be visualized by an X-ray examination; therefore, the X-ray film aids us in detecting lesions which otherwise would not be located. This is particularly true of the first infection type of tuberculosis. There is still another group of lesions so small that the X-ray film will not aid us in their detection. Nevertheless when lesions of the re-infection type develop in the lungs to such proportions that they threaten the future health of the host or liberate tubercle bacilli in the bronchial tree so that they are cast from the body in such a way as to infect the bodies of other persons, the X-ray film is of great value. Although it fails to reveal some of these cases, it aids us in the detection of the location of most of them and usually before the germs can be found in the sputum. Tuberculosis is a disease which, when destructive, appears in two chief

forms; the one is rapidly progressive and usually takes life in a short time. Good examples are tuberculosis meningitis and miliary tuberculosis; the other form is chronic, that is, it is very slow in its development. Usually years pass during which the chronic type of disease is detectable by X-ray films but before any external manifestations by way of symptoms are obtainable. This is particularly true of tuberculosis of the lungs. If the disease is detected during this period of its slow development, and before it has become extensive, it may be treated very successfully, often without the loss of much or any working time on the part of the patient. This applies to girls and boys of school age, particularly after they have passed the seventh grade. Thus, a great service has been done the individual who is so fortunate as to have had his tuberculosis detected before it has incapacitated him. Perhaps the service is greater to the community in that the disease has been detected before it has broken down and is eliminating the germs of tuberculosis to others, thus starting all over again the vicious cycle of tuberculosis in the community. This procedure will be made almost as effective as that of the veterinarian which requires slaughter of diseased animals. In the human body proper treatment begun sufficiently early results in slaughter of the disease, the extension of life, and the prevention of spread of the disease.

Our present procedure in tuberculosis control is capable of preventing the large numbers of deaths from tuberculosis between fifteen and forty years. Everyone must die, but we have no right to allow the great destruction in the most productive period of life's span from preventable diseases, like tuberculosis, to continue. When a person falls ill after the age of fifty or sixty years of a degenerative disease, cancer, or senility, it is beyond our power to help. This is not true of tuberculosis, as it attacks between the ages of fifteen and forty years. Woods Hutchinson says: "The man who lives to 55 or 60 has lived his life, paid back the race for the pain of his bearing, and the care and cost of his rearing, passed on the torch of life to the next generation and started it well on its way, and the end, whenever it may come, has no terrors for him. Death itself is nothing, a mere ceasing to live, painless, natural, welcome to nine-tenths of all to whom it comes, a rest after life's fitful fever. Our best immortality is the survival of what we have done to make the world better for having lived in it." If we control tuberculosis successfully, we will give millions of people of the present and future

generations the opportunity to enjoy life and to contribute to the world's good, who otherwise would die untimely deaths from tuberculosis.

We now possess every scientific fact that we need to control tuberculosis. It can be controlled by methods based on the same principles that are used in the control of diphtheria and typhoid fever. To continue to seek an effective immunizing agent for tuberculosis is laudable. Whether such an agent, which is safe and truly effective, will ever be available is still questionable. Therefore, to postpone the employment of methods capable of completely controlling tuberculosis while waiting for an immunizing agent which may never materialize, would mean victory for tuberculosis. The eyes of the tuberculosis workers of the nation are being focused on your project. I am certain that your method of attack is sound and that your work will be productive of many valuable facts which can be used throughout the world in the control of tuberculosis.

FRACTURES OF THE JAWS

(Continued from Page 322)

The skin incision is closed by suturing. Traction on this wire will usually draw the posterior fragment down and back to a normal position where it can be fastened to a hook extending down from an orthopedic plaster head cap or to an adhesive strap which passes around on the other side of the neck. In the event of considerable resistance to the replacement of the fragment, rubber binder traction is used until the pull of the muscles has been overcome.

Fractures of the lower jaw involving the third molar teeth present some problems that warrant discussion. The line of fracture may be in front of the third molar, which is found to be securely fixed in the posterior fragment. Not infrequently the crown and the distal root may be firm in the posterior fragment with the mesial root fractured and separated from the rest of the tooth. (Figure 8.) In other cases the fracture lines may involve the root end of the third molar and extend upward both anteriorly and posteriorly to the tooth. In these cases the temporary retention of the third molar is essential in order to prevent upward displacement of the posterior fragment.

In these third molar cases extra precautions must be taken to control any infection of the line of fracture by maintaining drainage at the gingival area and by the use of irrigations. In the event of a low-grade infection persisting, it will usually be found that in three or four weeks' time sufficient consolidation will have taken place to prevent upward displacement of the posterior fragment. The intermaxillary wires can then be cut, the third molar tooth extracted, and the teeth again wired shut in occlusion. Following the extraction of the tooth, infection usually subsides quickly and bony consolidation proceeds apace.

In cases of fractures just behind the third molar tooth that show practically no mobility, it is wise to leave the tooth in position unless examination shows it to be loosened. The parts are immobilized by indirect dental fixation using the standard wiring methods or modifications. In a well-kept mouth there are usually no complications. If, however, there is gingival infection present, particularly where there has been a lack of full development, as evidenced by incomplete eruption and impingement of the cheek tissues in this region, one may anticipate considerable swelling, infection, and complications. For this reason it is usually advisable to remove the tooth from the line of fracture. Serious bone infection, such as osteomyelitis, though infrequent, is more likely to occur in fractures in this region than in other parts of the mandible.

FRACTURES OF THE ANGLE AND THE RAMUS

Fractures of the Angle and the lower portion of the Ramus are not infrequent and in most cases present but little displacement. When, however, the periosteum is badly torn and the impact has been great, there may be considerable mobility and displacement caused by over-riding. The cases showing but slight mobility and no displacement are held by indirect dental fixations using standard wiring or by the use of external arch bars or splints where there are not enough teeth available for wiring. When there is a forward displacement of the ascending Ramus fragment which does not improve in position when the muscles are put at rest, Darcissac's procedure should be followed. See Figure 7.

(End of Part I)

Hemangioma of the Bladder: Report of a Case

J. F. Malloy, M.D.
Mitchell, S. D.

PAPILLOMA and carcinoma of the bladder are of fairly frequent occurrence, especially in elderly patients. Benign tumors of the bladder, however, are rather uncommon. The usual types of benign tumors are fibroma, myoma, fibromyoma, and hemangioma. The hemangioma are the rarest of all. In a review of the literature, only one case of hemangioma of the bladder was found reported; that, by Marion in the *Journal of Urology*, Paris, 1928. Albarran also mentions this tumor in his book "Tumours de la Vessie." The following case is one of hemangioma of the bladder:

CASE REPORT

Mr. L. K., male, age 18, admitted to the hospital January 21, 1931. His complaint was as follows: Since he was four years of age, he had been having intermittent attacks of hematuria. These attacks came on at intervals of one to two years, and lasted for a period of four to six weeks. There was no pain, urgency, frequency, or other symptoms present, but the urine was always quite bloody and very frequently contained clots. The bleeding would continue until the patient became so weak and anemic that he would be confined to bed, when the bleeding would gradually subside. The present attack began October, 1930, and he was still bleeding on his admission to the hospital, a period of four months. The family and past history was of no particular significance.

Physical Examination—A tall, undernourished youth with marked pallor of the fingernails, and mucous membranes. The teeth and throat were negative. The chest was negative. The heart was normal in size and position, rate 120. A haemic murmur was heard over the pulmonic area. The abdomen was scaphoid. The spleen was palpable about 2 c. m. below the costal margin. The blood pressure was 106 over 68. The temperature was 100. Laboratory findings: The hemoglobin was 50%; R. B. C., 1,750,000; W. B. C., 9,000. The differential was characteristic of a marked secondary anemia. The blood Wasserman was negative. X-ray of the kidney,

ureter and bladder region was entirely negative.

On cystoscopic examination, the bladder urine was quite bloody, and many clots were present. The trigone was normal in appearance. Both ureteral orifices were normal in position, in appearance, and functioned normally. Catheters were passed to both kidneys. The flow of urine from either side was normal, and was entirely negative on chemical and microscopic examination. On the dome of the bladder there was a bluish tumor about the size and appearance of a plum. This was bleeding profusely from multiple small areas. About this tumor mass for an area of one or two c. m., the bladder mucous membrane was thickened and appeared dark blue in color. The bleeding was so marked that it was rather difficult to clearly visualize the tumor mass. A tentative diagnosis of benign tumor of the bladder was made, and operation advised.

Operation was performed under spinal anesthesia with supra-pubic exposure. The peritoneum was dissected loose from the bladder. The Urachus was divided and the dome and posterior wall of the bladder was rotated up into the wound. At the site of the tumor mass, on the outer surface of the bladder, there were several cysts varying in size from one-half to one and one-half c. m. in diameter containing a clear, yellow fluid, evidently lymph. These were removed, the bladder opened, and the portion of the bladder wall containing the tumor, including a margin of one-half to one c. m. of normal bladder wall was resected. The bladder was closed in the usual manner with a supra-pubic drain and a permanent catheter. The supra-pubic drain was removed on the third day, and the sinus was healed on the fourteenth day.

The main body of the tumor measured



three and one-half c. m. in diameter and three c. m. from the dome to the base. It was firm in consistency, dark blue in color, and over the surface there were numerous, small cysts from one to three m. m. in diameter, most of which were filled with dark blood, and on pressure, oozed freely. There were others filled with a clear, yellow fluid. On section, the tumor showed numerous similar cysts varying in size from one-half to one and one-half c. m. in diameter. Most of these were filled with dark blood, a few with clear, yellow fluid. The bladder wall itself was markedly thickened. Pathological diagnosis was hemangioma of the bladder with marked hypertrophy of the muscular wall.

The patient made an uneventful recovery. At the present writing, his blood count is normal, and cystoscopic examination reveals no recurrence of the tumor.

POST-GRADUATE STUDY IN VIENNA

(Continued from Page 325)

who spend less than that amount and there are many who spend more. The average length of time that doctors stay in Vienna is three months. Some stay only one month and others, on the other hand, stay one year or even longer.

About living expenses one may state that they are much lower than they are in the United States. One may get a nice room in a Pension for \$2.00 per day, including three meals. Many spend only \$1.50 per day, depending upon the individual taste for living and the ability to pay. Hotels are more expensive than Pensions. Rooms in private homes are the cheapest. I know a few doctors who are spending here for both study and living only as much as they would have to spend for study alone in a reputable post-graduate school in America. And this is, by the way, one of the reasons why some come here. Many who come here with their wives spend from \$75.00 to \$100.00 per month for fairly comfortable living.

As to the expense for amusements, one may see the highest type of opera for about one dollar and have a fairly good seat. Concerts and German plays are still less expensive.

A FEW MORE INTERESTING FACTS

Some doctors avail themselves of the additional opportunities offered and take a short internship (or "Hospitants" as they are called here) in several of the leading clinics and hospitals. There, under the guidance of one of the assistants, they

have a chance to do some practical work on patients. This work is usually done during the forenoons and costs from \$10.00 to \$45.00 per month. Those who have some knowledge of German naturally get more out of this work.

In some specialties there are not only single courses but also organized, combined courses, lasting for several weeks, and well outlined with a view to cover all important phases of those specialties. There is such a planned-out, intensive course in ophthalmology, given by such well-known eye specialists as Professors Meller, Lindner, Fuchs, etc. This course is given each year, beginning October 1, and lasting for nine weeks. From time to time such outlined courses are also given in gynecology and obstetrics, neurology, etc.

According to an agreement with the University of Vienna, all members of the A. M. A. who have studied medicine in Vienna for at least four months and have completed satisfactorily a minimum of 300 study hours, are entitled to a University Certificate, stating the length of time the student has studied and the number of courses he has taken. The Allgemeine Policlinic also grants certificates for post-graduate work, on the same basis as the University.

"Ars Medici," the handy and valuable official organ and bulletin of the American Medical Association, is published monthly and edited from the headquarters of the organization. This magazine contains reviews and abstracts of the latest publications in foreign medical literature, with special departments devoted to German and Austrian medical discoveries and research. It is the only medical journal published in English on the Continent.

In conclusion I wish to add a few more reasons why doctors come to Vienna. Vienna has the reputation of having trained a great many of the prominent American specialists for their distinguished careers. Most of our great specialists studied here for some time. In addition to the opportunities for work, Vienna offers a pleasant and interesting place not only for the Pater Familia himself, but also for the rest of the family. The children can take music lessons; the wife has an opportunity to get in touch with European culture; then the entire family can enjoy, in the evenings, the best concerts and the finest operas in Europe.

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THE NORTH DAKOTA MEETING

The North Dakota State Medical Association held its annual session in Valley City on June 1st and 2nd, which was preceded by a meeting of the delegates and council on May 31st.

Valley City is to be congratulated upon the scientific program, the large number of cases offered for clinical work (far exceeding the number of persons who could be examined and discussed by the attending physicians), the excellent accommodations for the conducting of clinics, and the comfortable rooms for the meeting. In other words, the committee handled the affair so energetically and capably that one might have imagined himself in a much larger town with its clinical facilities, hotel accommodations and all that. Although old Sol was rather persistent, the Sheyenne Valley crowd had it so skillfully arranged for cooling relief that it must have been a decided expense to the local physicians.

The banquet of the first day's regular session was presided over by Toastmaster Frank Darrow, Dr. F. L. Rector, and Mr. L. Benshoof, Editor of the Detroit, (Minn.) Record. The latter made a forceful and interesting plea for more decided co-operation between medical men and the public press.

Clinics were conducted by Dr. F. C. Rodda of Minneapolis, and Dr. M. S. Henderson of Rochester, Minnesota. The Anti-Cancer film demonstration by Dr. Rector, showing highly magnified

processes of cell development, etc., was very instructive and appreciated by the audience.

Dr. R. E. Scammon's "Guild Medicine" was very well received and recalled to the men how our profession differs so much from other organizations such as law, commerce and others of strictly commercial interest.

Dr. J. D. Carr, Superintendent of the Jamestown State Hospital, urged that more attention be paid to the childhood age, in an effort to interpret tendencies toward impaired mentality. North Dakota should endeavor to have some centrally located psychopathic hospital where such children and even adults beginning to show mental abnormality, could be examined and treated. Thus, for the time being at least, it would enable such persons to get the benefit of expert advice; then later, if deemed necessary, legal commitment could be effected.

Dr. Frank Darrow's paper on "Diabetes Mellitus" gave valuable data and was encouraging in view of the prognosis in this affliction.

Dr. A. E. Pierce of Minot, North Dakota, gave an excellent review of "Coronary Thrombosis," comparing the differential diagnosis between that and Angina.

Dr. Bodenstab's theme was the perennial one of how to diagnose and evaluate the relative and actual damage done to a claimant against the State Compensation Board. The Board desires to deal justly with claimants but urges medical

men to handle these types of cases in the most skillful and honest manner possible.

Dr. J. de J. Pemberton of the Mayo Clinic gave a very interesting paper on "Carcinoma of the Rectum and the Restosigmoid."

Dr. L. W. Larsen of Bismarck reported for the Committee on Public Policy, stressing the efforts made by the various cults at the last state legislative session.

Dr. A. M. Brandt of Bismarck gave a valuable paper on "Uterine Bleeding from Causes Other than Pregnancy."

Dr. J. F. Hanna of Fargo completed the program with a well-written description of the best methods of handling Persistent Occipital Positions.

The local women's auxiliary gave an unusually fine series of entertainments and banquets to the visiting ladies. Cordiality was the keynote with them.

The results of the elections were as follows: Dr. Jesse Bowen, Dickinson, President; Dr. C. E. Stackhouse, Bismarck, President-elect; Dr. A. D. McCannel, Minot, First Vice-president; Dr. W. A. Gerrish, Jamestown, Second Vice-president; Dr. Albert W. Skelsey, Fargo, Secretary; Dr. W. W. Wood, Jamestown, Treasurer.

A. W. S.

DO YOUR PATIENTS EAT OR DRINK?

Those who recall an editorial in a Minneapolis daily about thirty-five years ago commenting upon the growing tendency of business men to stay downtown for lunch instead of going home, will doubtless remember how impressed they were by this significant comment on the city's rapid growth and its tremendous rush of daily affairs.

Looking backward, one remembers the many cafes and clubs where food was actually served and leisurely enjoyed at tables in an atmosphere of cheerfulness and friendly chatter. Then the stress of the times and the inventive genius of man produced counters and trays. This crystallized the typical lunch into a ham sandwich, apple pie and coffee and the conversation boiled down to "make it snappy."

Some have contrived to eliminate the time-consuming act of mastication by substituting a malted milk. When Meredith wrote "civilized men cannot live without dining" little did his poetic soul suspect how soon that gastronomic feat would be reduced to the mere act of deglutition.

Do your patients sit down at a table, put their feet under it, relax and eat; or do they take it

on the run, like the Twentieth Century Limited scooping water from a trough without stopping? Is it not timely that we encourage a revival of interest in the ancient art of Fletcherism?

A. E. H.

CONCERNING THE PRESCRIBING OF MEDICINAL LIQUOR

How fortunate for us that on May 15th we said, editorially speaking, "We are and always have been in favor of adult education." The very next day, along came a document from the Bureau of Industrial Alcohol of the United States Treasury department which would indicate that *we have to be in favor of adult education*, if we would continue the unrestricted practice of our profession.

Never before were physicians required to specify the length of time for which the liquor was prescribed, but according to the new regulations, this must be written on the prescription itself. Although a quantity of liquor may be prescribed to supply the needs of a patient for a period of thirty days, it is very important that the dosage and frequency of dose be properly computed to correspond with such amount. It will be seen therefore that if a wine glass of whiskey were prescribed every two or three hours, a pint could be prescribed each day; while if the directions were two teaspoons three times a day, such pint quantity would be prescribable only every twenty-two days.

We suspect that there will be many urgent and eloquent advocates for the maximum dose.

According to the latest ruling at hand, the dose and its frequency is sufficient evidence of the length of time for which the whole amount is prescribed, and it need not be otherwise indicated.

A. E. H.

THE 1933 MINNESOTA STATE MEDICAL SESSION

The Rochester setting lent itself agreeably to the fine program of the 80th Annual Session of the Minnesota State Medical Association on May 21-24. Great pains had been taken to insure a wide variety of subjects both in the formal presentations and in the demonstrations as well as in the scientific exhibits, including the scientific cinema. Commendable, too, was the absence of overlapping of important features, enabling anyone who wished to follow the program through from start to finish to do so in orderly sequence.

The evenings were devoted to the consideration of economic topics, without which no well-

ordered medical gathering nowadays is complete. Here shone brightly the wit and wisdom of Morris Fishbein, the scholarly philosophy of Archbishop Murray, and the hard headed reasoning of Dean Lewis in a galaxy of our own stars.

Of course there were social features but they were tucked in unobtrusively without encroaching on the regular program in any way.

The whole thing was a complete success. It was a big show in compact arrangement with the machinery running so smoothly and efficiently that everyone who attended could absorb what he wanted to saturate with a minimum of effort. It was a lasting credit to the organized profession of Minnesota and its accredited representatives.

G. C.

REVISION OF FOOD AND DRUGS ACT

Among the manifold activities of the new administration in Washington, the national pure food and drug law is receiving attention.

It was during the administration of President Theodore Roosevelt, about twenty-seven years ago, that the present law was enacted, and it is little wonder that many deficiencies in its provisions should have been disclosed with the enforcement experience and progress of so many years.

Many will remember how Dr. Harvey Wiley, the pure food administrator of those days, fought the use of sodium benzoate as a preservative, and the admission of corn syrup "because it was nothing but glucose." The president was quite surprised that "a syrup which Kermit liked so well with his griddle cakes each morning" could be so very bad for general consumption. The controversy between the canning industry and the government made first page reading for a long time.

Among the provisions of the new draft are clauses that give the government authority to prevent false advertising of foods, drugs and cosmetics and to establish tolerances for added poisons in foods, where such presence is unavoidable. Physicians will be most interested, however, in the provision for "control of drug products on the basis of therapeutic claims which are contrary to the general agreement of medicinal opinion." The burden imposed by the

present law of proving, not only that such statements are false, but that they were made with fraudulent intent on the part of the manufacturer has seriously handicapped the Department in the extension of adequate protection to the public in the purchase of drugs labeled as treatments for various diseases. This necessity will be removed by the proposed enactment.

A. E. H.

A SPIRITUAL RENAISSANCE IN MEDICINE

We venture to assert that the majority of scientifically trained men are materialists. They are altogether too prone to think of pathology as that branch of medical science which treats of changes in structure caused by disease, forgetting that it treats of modifications of function as well. Text books on pathology are at fault, being little more than catalogues of the variations in macroscopic and microscopic tissue changes seen in different diseases after death.

In approaching any disease, it is important to think of the structural changes taking place and the resultant modification of function, but it is also important to bear in mind that there may be modification of function quite apart or entirely without any such structural changes.

Medicine appears now to be at the threshold of a spiritual renaissance. The mental processes are of two groups. One of these controls the conscious daily ideas and acts, while the other is concerned with the subconscious beliefs and wishes of the past. In their constant merging, the conscious group dominates but in event of a break, psychoneurosis results and for this Freud prescribes analysis. Emotional states are being ascribed more and more as factors now in visceral disorders and many other disturbances, and psychoanalytic methods of treatment are being resorted to for these states. The surgeon cuts the red tape (which in this case is white) by directly severing the lines of communication of the organs involved through so-called ramisectomy or denervation, and great enthusiasm is manifested by those who have been following these experiments into new fields.

A. E. H.

Proceedings Minneapolis Clinical Club

Meeting of April 13, 1933

President, Archie H. Beard, M.D., in the chair.

INAUGURAL DISSERTATION THE APPLICATION OF THE PRINCIPLES OF LOCAL ANAESTHESIA TO THE TREAT- MENT OF PERIPHERAL NERVE MANIFESTATIONS

ROBERT P. CARON, M.D., F.A.C.S.

Various nerve and nervous lesions manifested by localized pain may be relieved or cured by the injection of various local anaesthetics into or about the peripheral nerves supplying the painful area. This therapy is admittedly symptomatic, in some cases empirical, and may also be diagnostic.

The various peripheral nerve manifestations dealt with by this method are as follows:

(1) Psychalgias, defined as central interpretation of pain without known somatic and peripheral cause. Admittedly these are hysterical in most cases and the treatment by injection of these diffusely sensitive skin areas is undoubtedly along the lines of suggestive therapy.

(2) There are those peculiar neuritic manifestations which are evident in people with an adipose tendency; those people whose subcutaneous tissue, when subjected to single or repeated traumata, develop an exquisite sensitiveness which is most troublesome. This same condition frequently presents itself in the immediate neighborhood of varicosities, especially those types associated with diffuse venule formation. The diagnosis is determined, not by any specific history or finding, but rather by the presence of sensitivity on picking up the deep or subcutaneous fat. Relief may frequently be obtained most spectacularly by injecting a few cubic centimeters of one per cent quinine urea hydrochloride into the subcutaneous fat.

(3) Referred pains of somatic origin such as the pain of angina pectoris, coronary thrombosis, aneurysm of the aorta, cholelithiasis, renal colic and other pains referred from abdominal or pelvic viscera. The neuro-anatomy of pains of cardiac origin is given and the Edinger-LeMaire theory as modified by Rudolph and Smith is advanced as an explanation of the rationale of this treatment.

Local infiltration of skin areas is considered only as a valuable adjunct to morphine in these intolerably severe afflictions. In the continuous pain of aneurysm, paravertebral injection of the cervical sympathetic ganglia gives relief without hazardous sympathectomy.

(4) Neuralgias or pain due to involvement of nerve trunks. In this class are mentioned trigeminal neuralgia,

neuralgia of the sphenopalatine ganglion, the pain on swallowing in tuberculosis of the larynx, sciatica, peri-arthritis and myositis of the lumbosacral region and of the extremities, and in pain due to traumatic reflex contractures.

The injection of ninety-five per cent alcohol into the ganglion of the fifth nerve is a comparatively safe and simple procedure and usually results in a permanent cure. Therefore, it should at least be tried before ganglionectomy is advised. Similarly repeated injections of quinine and urea hydrochloride into the sciatic nerve should be tried before resorting to the drastic fusion operation. The use of novocaine in peri-arthritis, fibromyositis and traumatic reflex contractures reveals the amount of true disability and may, moreover, be used to relieve pain in therapeutic attempts to break down painful adhesions as well as for the temporary relief from pain thus afforded.

(5) Myalgias or painful localized areas in muscle, particularly in the abdominal muscles, in the lumbar muscles and in post-operative scar tissue. These conditions may be diagnosed and relieved, temporarily or permanently, by the injection of novocaine or quinine and urea hydrochloride.

In the above conditions, points in diagnosis and in the technic of treatment are either suggested or given in detail. The extensive bibliography enables one to ascertain methods in detail.

CONCLUSIONS

(1) A plea is made for symptomatic relief of peripheral nerve manifestations.

(2) Principles of the application of local anaesthesia are often effective in giving such relief.

(3) Radical operative measures are not indicated in many conditions until more conservative measures have been given a fair clinical trial.

(4) The relationship of physician to patient in its best sense is thereby maintained.

DISCUSSION

DR. STANLEY R. MANEINER, Minneapolis, Minnesota: I wish to take this opportunity to compliment Dr. Caron on the excellence of his paper which I was very glad indeed to hear.

One of the points which must be accepted in the local anaesthetic injection, as described in the text, is that the results and the reasons why are difficult to explain and must be accepted on an empirical basis. We have both observed these marked benefits in some of our more or less obscure cases but have been entirely unable to analyze the mode by which we have obtained relief. This is particularly evident in the case of so-called psychalgias.

By local anaesthesia injection over the median aspect of the knee, a patient obtained striking relief when removal of her semilunar cartilage had failed.

Alcohol gives the most prolonged and lasting anaesthesia but must be used guardedly. Alcohol has been known to produce bone necrosis and when used in a motor nerve, may cause permanent paralysis. We have preferred to use our anaesthetic solutions in this sequence: First, novocaine; second, quinine and urea; third, alcohol.

We have not been able to use our block injection often in heart cases but the relief obtained has been so satisfactory that we believe this method should be used more frequently. One patient, suffering with absolutely intolerable heart pain, was injected and relieved completely for the six months that she survived her cardiac disease.

The case of sciatica referred to is outstanding. The patient had received no relief, although attended by a number of physicians. She had been practically incapacitated for nearly two years but received almost complete relief with the injection of novocaine and quinine and urea. In the sciatic cases, we have followed the technic of Hertzler who has done some outstanding work in the injection of the sciatic nerve for the treatment of sciatica. We have had some phenomenal successes and then again, we have had some complete failures. However, the method is comparatively simple and most assuredly is worthy of a trial before such radical operation as fusion.

As a diagnostic procedure in the differentiation of organic from functional disease, this procedure should always be borne in mind.

DISCUSSION

DR. E. S. PLATOU: I was interested in Dr. Caron's remarks concerning cases with pain of psychic origin. In children hypodermics of sterile water are a useful adjunct in the suggestive therapy of some functional disturbances. I have seen one case with frequent seizures resembling Petit Mal in which the attacks ceased abruptly with this form of treatment. Could it be possible that pain of psychic origin might likewise be benefited by the mental impression of an injection?

DR. E. T. EVANS: I have been interested in this subject ever since, as Dr. Caron has just told you, my father brought it to my attention. At that time he said that many serious operations could be avoided by the recognition of such conditions. We have seen a goodly number of such cases at the University during the past five years. They are the most grateful of patients if they are not compensation-minded.

As to the question of local injection for psychalgias, the type of fluid injected is not so important. At the University we injected quite a few with normal saline and sometimes mercurochrome with the same results.

DR. J. K. ANDERSON: We use the alcohol injection for pruritis ani and in a large percentage of cases it lasts for about three months. Many times the patients return for a second injection. I don't think we have had a great many that I can recall which have been

permanent. We have not used the quinine urea for this purpose. I am speaking of essential pruritis.

In the study of this condition I have rather shifted around to the idea that a lot of these conditions are caused by an allergic condition due to some food. We have had several cases recently which have been put on an elimination type of diet and have cleared up. The things they usually react to or are sensitive to are milk, eggs, and white flour. I cannot report anything definite on this but there are certainly some cases in which allergy plays a very definite part.

As to the alcohol injections, I would say, from our experience, that it certainly is not a "cure-all." We always do that first before a more radical Ball's operation. I have had no experience with quinine urea for this condition.

DR. R. P. CARON: I want to thank the doctors for their discussions.

Answering Dr. Platou, in certain types of cases due to psychalgic origin, a needle piercing the painful area intradermally may give satisfactory results without the injection of any solution at all.

I should like to recall that relief of pain by the injection method is not all on the basis of psychalgia. Secondly, that the breaking up of painful joint adhesions can be enhanced by the injection of a local anaesthetic to the affected joint.

INAUGURAL DISSERTATION THE CERVIX UTERI AS A SOURCE OF FOCAL INFECTION

CLAUDE J. EHRENBERG, M.D.

SUMMARY

Cervicitis, as a cause for uterine malignancy and uterus disfunction, has been widely accepted but cervicitis as a focus of infection has received little emphasis.

Curtis, in 1914, was first to name the cervix as a chronic focus of infection from which leukorrhoeal discharge originated. Other workers, including Sturnidorf, Langstroth, Monench and Benedict have related the cervix as a focus of infection to various constitutional conditions.

Three pictures must be considered in thinking of the cervix as a focus of infection; first, the well known susceptibility of the mucus membrane of the cervix to bacterial invasion and the retention of this infection due to the racemose character of the glands; secondly, the uterine lymphatic system whose relation to the glands and the muscle is so intimate as to involve the muscle with every cervical infection; and third, the muscular action and rhythmicity of uterine musculature.

The involvement of the cervix with bacteria may be by ascent from the vagina but the observation made by the writer of cervicitis following infection in other places and the further observation that a stubborn cervicitis healed after the removal of other foci of infection, suggests the cervix may be involved through the blood stream.

Symptoms of a constitutional nature may be due to cervicitis when pelvic symptoms are absent, and are as

variable as when due to other foci of infection. The treatment of cervicitis as a focus of infection must remove the infectious area. If the infection is limited to the glandular areas cautery and the operations designed to remove the glandular tissue should suffice. However, if the infection extends through the glands and into the lymphatics high in the myometrium, some treatment more radical in nature may be necessary.

DISCUSSION

DR. H. M. N. WYNNE: The subject discussed by Dr. Ehrenberg is of great importance to all practitioners. I have been interested for a number of years in the relation of cervicitis to arthritis. In searching for focal infection I believe in examining the genital tract carefully and attempting to eradicate all inflammatory lesions. However, in the great majority of such patients my results have been disappointing to me and to the patient. I have used the actual cautery for treatment of cervicitis in several hundred women with, I believe, excellent results locally but without change other than local in the great majority.

I have had no experience in the treatment of cervicitis in patients suffering from chronic sepsis. I have seen little relief from backache or abdominal tenderness following cervical cauterization. The two cases of primary peritonitis, presumably due to cervical or vaginal infections which I have observed, were not proven satisfactorily.

In my experience I have seen no case of bladder irritability or urinary tract infection relieved by treatment of cervicitis. In most cases of bladder irritability in women there is definite evidence of some abnormal condition in the urethra, bladder, ureters or kidneys. However, Hunner has cited some cases of simple urethritis where no permanent relief was obtained by local treatment but which soon became free of urinary symptoms following tonsillectomy. It would seem that a cervicitis might also be a focus in similar cases, although I have not observed such in my practice. Of course, one must be particularly careful in drawing conclusions in these cases as it is common for bladder irritability to be better or worse intermittently.

In the treatment of cervicitis with the cautery it is usual to limit the burning to that portion of the cervix which is visible. All of the infected tissue is not destroyed. When the mucous glands of the entire cervix are infected there is small possibility of completely eradicating the diseased tissue without causing serious damage such as complete stenosis or stricture of the cervical canal. It is not infrequent to see a stricture of the external os following the cauterization of the everted cervix. I have had this occur in a cervix which I have cauterized and in others cauterized elsewhere.

The Sturmdorf tracheloplasty for cervicitis is valuable but has not been entirely satisfactory in all my cases.

We wish to congratulate Dr. Ehrenberg on his careful study of the literature and citation of his personal experience. I feel sure that the infected cervix can

be a focus of infection causing symptoms elsewhere in the body but in my experience the relief of symptoms following apparent eradication of the cervicitis has usually been confined to the cervix. However, we should not overlook cervicitis in the search for foci of infection nor neglect the treatment of it when found.

DR. R. E. SWANSON: I enjoyed Dr. Ehrenberg's thesis very much. His study of the literature on this problem is certainly exhaustive, and his personal observations are most interesting.

The fact that the cervix may be a focus of infection is quite generally accepted. In treating cervical infections it is well to remember that they may represent pre-cancerous lesions and that their eradication may reduce the incidence of cervical cancer.

DR. E. S. PLATOU: The case referred to by Dr. Ehrenberg was that of a girl, age 7 years, convalescing from scarlet fever, who, following symptoms of vulvovaginitis, developed a pelvic and later a generalized peritonitis. So-called vulvitis is not a rare complication in some of the eruptive fevers and may result in adenitis, peritonitis, and occasionally in gangrene. Examination with the vaginoscope has demonstrated that cervicitis is usually a part of this disease and cervico-vaginitis is probably a better name. McCartney of Edinburgh was able to demonstrate a mild cervicitis in female monkeys who were developing peritonitis following implantation of bacteria in the vaginal vault. Bacteria without inflammatory change was found in sections of the genital tract between the cervix and the peritoneal cavity.

DR. C. J. EHRENBURG: What Dr. Wynne mentioned about cauterization and the Sturmdorf operation not being entirely successful is not an uncommon observation.

In regard to the pathology of cervicitis, the question of whether the infection is limited to the mucosa or whether it is higher in the myometrium is undecided. It is for this reason that there is controversy about the histological picture and the extent of the treatment. Harris examined 63 specimens of the uteri which had been amputated supravaginally and in 23 he found round cell infiltration in the myometrium as high as the lower uterine segment. If round cell infiltration is indicative of infection, this may be a basis for considering removal of the uterus in cases of widespread cervicitis. If, on the other hand, infection is limited to the glandular tissue and the round cell infiltration is the result of toxins from this area, cauterization should serve to relieve the condition.

In cases of arthritis it is well to remember that if they are of long standing the removal of the focus will not relieve because of the fibrosis in the joint.

Chronic sepsis may be a misleading term but what I meant by it is any of the conditions that one may attribute to focal infection. I think anyone doing obstetrics can recall cases complaining of weakness, backache, nervousness and other functional conditions which have been relieved by treating a cervicitis.

Dr. Swanson mentioned carcinoma, a subject which I did not mention. There is considerable controversy

about the histology in this condition. The work of Frankl describing the transition of the columnar to squamous epithelium during the fetal period is interesting in this respect. We have always believed that carcinoma was more frequent in women who have borne children. However, Dr. O'Brien, in examining statistics and comparing them to the census figures, found that the incidence of carcinoma in single women was the same as single women in the census figures. In other words, there are as many cervical cancers relatively in single women as there are in married women.

Uterine function in relationship to cervicitis I did not mention, but cervicitis has been given as the largest single cause of sterility; also having a definite relationship to miscarriages. It also involves the deviations in menstrual function.

Dr. Platou mentioned vulvo-vaginitis. Stein in Chicago examined 296 consecutive cases of vulvo-vaginitis with a vaginoscope, an instrument corresponding to about the size of a female cystoscope and attached to a lighting arrangement, and of the 296 consecutive cases of vulvo-vaginitis he found that the cervix was involved in practically every one. He also found that in only one-fifth of the number was the condition caused by the gonococcus. These findings would indicate that the cervix can be involved metastatically.

In closing, I believe the cervix, as a focus of infection, has been neglected. There is controversy as to the involvement and for this reason the treatment is unsettled. The present popularity accorded to the cautery gives relief many times but may not be sufficient. Like investigating other focus of infection problems, it is difficult to obtain definite facts and many conclusions must be based on inference and clinical observation.

THE EMERGENCY TREATMENT OF FRACTURES OF THE UPPER AND LOWER EXTREMITIES—MOVING PICTURES

ROSCOE C. WEBB, M.D.

DR. R. C. WEBB: In the nationwide effort to improve and standardize the basic methods in the treatment of fractures, attention is being given to the emergency treatment. In the fracture oration presented two years ago before the American College of Surgeons, Dr. William Darrach spoke on First Aid as follows:

"The injuries resulting from fractures are not limited to those occurring at the time of the accident. Unwise attempts to use the injured extremity may cause or increase displacement of fragments, increase the lacerations of soft parts, and perhaps lead to penetration of the skin by the ends of the bone. Similar additional trauma is often due to the awkward efforts of the bystander. A man is struck by an automobile, thus breaking his leg. Except for the broken bone, without displacement, the original injury may be merely a slight periosteal tear and a mild contusion of the soft parts, but he is helped to his feet and the leg gives way and the fragments slide by each other, thus stripping off the

periosteum and tearing the muscles. He falls to the ground only to be picked up and carried to the sidewalk with leg dangling. Larger blood vessels are torn and the end of the bone comes through the fascia, perhaps the skin and even the trouser. He is laid at rest with a coat beneath his head and surrounded by people anxious to help. Someone sees that his leg is crooked and straightens it out. The exposed end of the bone re-enters the wound with a bit of trouser and the dirt of the street. He is lifted up and carried to a car or ambulance. This time someone carries the injured leg with better intentions than co-ordination and the ends of the bone are churned around in their bed of lacerated tissues and the contaminating organisms are well disseminated throughout the area. During his ride and in the transfer to the accident ward or the doctor's office, unless he has been carefully splinted, there is more jolting and more damage. Would that his troubles were over, but too often the sad story continues. Lack of sufficient protection as he is lifted to and from the X-ray table and as he is being anaesthetized results in still more injury.

"Compare this exaggerated picture with a similarly injured man who is allowed to remain where he is until a proper splint can be applied, or at least until he can have someone pull hard on his foot as he is being lifted and carried, whose examination is thoroughly but gently carried out, and whose treatment is instituted with but little additional injury. The difference in these two cases as regards period of disability and amount of permanent functional disturbance is great."

Dr. Webb then presented moving pictures showing the emergency treatment of the fractures of the upper and lower extremities as carried on in the Department of Public Safety of Philadelphia following the method in use by the ambulance service of the Beekman Street Hospital of New York City.

The meeting adjourned.

H. BRIGHT DORNBLASER,

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.

A son was born to Dr. and Mrs. Sherman T. Stenberg, Hudson, Wis., on May 22, 1933.

Duluth was selected for the 1934 convention city for the holding of the next meeting of the Minnesota State Medical Association.

Dr. Wm. C. Bernstein, New Richland, Minn.,

left for Europe last month, where he will spend several months in post-graduate work.

Dr. Charles N. Spratt, Minneapolis, was a guest speaker at a meeting of the Ophthalmological Society recently held at St. Louis, Mo.

Dr. Albert Fritsche, New Ulm, has been named a member of the Minnesota state board of medical examiners by Governor Floyd B. Olson.

Dr. Thor Thoreson, who was in active practice at Benson, Minn., for many years, died at his home in Oslo, Norway, last month, at the age of 71 years.

Dr. M. W. Roan, Bismarck, N. D., was in attendance at the annual meeting of the American College of Surgeons, recently held at Washington, D. C.

Dr. J. E. Nyquist, Duluth, died on May 25, after several months' illness. Dr. Nyquist was 60 years of age and a graduate of the University of Minnesota.

Sixty students of the St. Mary's School of Nursing, Rochester, were graduated last month, with Dr. Hugh Cabot of the Mayo Clinic giving the commencement address.

Dr. J. J. Kolars, Le Center, Minn., has gone to Europe, where he will spend four months in post-graduate study in Vienna, Berlin and Budapest. This is the doctor's second trip abroad in search of medical study.

About 50 members of the Stearns-Benton Medical Society were entertained by the staff of the U. S. Veterans Hospital at St. Cloud, Minn. After the dinner was served, various types of mental conditions and afflictions were discussed.

Dr. John D. Lyon, who has been in active practice in Minneapolis for over twenty years, died on May 28, from an attack of heart trouble. Dr. Lyon was always active in all medical and civic affairs of the city, and will be greatly missed by the profession.

Medical associates and other friends of Dr. E. D. Giere, chief of staff of Fairview Hospital, Minneapolis, came from all parts of Minnesota and surrounding states to honor him at a banquet on the fortieth anniversary of the year he began the practice of medicine.

The Eastern Montana Medical Association recently held their quarterly meeting at Glendive, and elected officers for the year as follows: Dr. H. J. Hall, Glendive, president; Dr.

B. C. Farrand, Jordon, vice-president, and Dr. M. D. Winter, Miles City, secretary.

The Chicago Medical Society will have a special booth located in the Hall of Science building at the Century of Progress Exposition at Chicago during the entire season, where information will be gladly extended to all visiting members, which includes the wives and daughters of all physicians.

Dr. J. T. Smallwood, one of the prominent physicians of Worthington, Minn., passed away last month after an illness of only a few days, at the age of 51 years. Dr. Smallwood's devotion to his profession was equalled only by his interests in community life, and more particularly in the small boy problems.

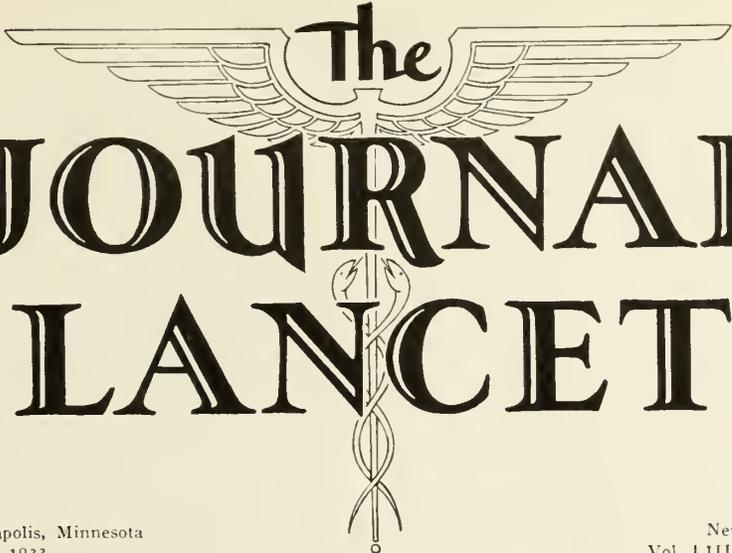
The Minnesota State Medical Association broadcasts weekly at 11:30 o'clock every Wednesday morning over station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). The program for the month will be as follows: June 21, "Cause of Anemia"; June 28, "Periodic Health Examination of Men."

Dr. Frank J. Savage, St. Paul, was elected president of the Minnesota State Medical Association. He takes office next January 1 and succeeds Dr. N. O. Pearce of Minneapolis. Others elected were Dr. Andrew Gullixson, Albert Lea, first vice-president; Dr. C. M. Robilliard, Faribault, second vice-president; Dr. E. A. Meyerding, St. Paul, re-elected secretary, and Dr. W. H. Condit, Minneapolis, re-elected treasurer.

Joseph G. Norby, superintendent of Fairview Hospital, was named president of the Minnesota Hospital Association at their annual meeting held last month in Minneapolis; J. H. Mitchell, Rochester, president-elect; Victor M. Anderson, Abbott Hospital, Minneapolis, first vice-president; Emma Leach, Owatonna City Hospital, Owatonna, second vice-president, and Arthur M. Calvin, Midway and Mounds Park Hospital, St. Paul, secretary-treasurer.

The state sanitarium for tuberculosis, located at Custer, S. D., since it was established by law in 1909, is entering a new era of tuberculosis prevention and cure when it institutes a post-graduate course for nurses, in tuberculosis work. Twenty nurses will take six months of work in all branches, starting June 1, and new courses will start each three months, with ten new students going in each time. Dr. Floyd Coslett is superintendent and Miss Lillian F. Hilt, director of nurses.

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The Indications For Tonsillectomy During Childhood*

Henry F. Helmholz, M.D.**
Rochester, Minn.

REMOVAL of the tonsils has become such a common procedure that it has been somewhat facetiously stated that their presence is an indication for their removal. On occasions this seems to have been not far from the truth. For many years removal of tonsils of children was an exceptional procedure, and still is in many European countries. With the development of preventive pediatrics, more attention was given to enlargement and disease of the tonsils.

The frequency of enlarged and diseased tonsils is variously given, and two competent observers, examining the same group of children, will vary considerably the percentage of children whose tonsils, in their judgment, should be removed. A person if examined immediately following an acute infection of the upper part of the respiratory tract, may have very large tonsils, and yet two months later the tonsils may have shrunk to well within the pillars. The decision to recommend removal of the tonsils on account of large size or other abnormal appearance should not rest on a single examination, but, on the contrary, normal size and appearance of the tonsils at any one examination is no indication that they are not a source of great danger to the patient.

The past history of the child is of far greater importance than the appearance of the tonsils at any one time, and it is therefore evident that the pediatrician or general practitioner is in a much

better position to determine whether tonsils need to come out than the specialist who sees the patient for the first time. At The Mayo Clinic the laryngologists remove tonsils of children only on recommendation of the pediatricians, because the laryngologists feel that the pediatricians are in much the better position to judge of the necessity for such a procedure.

Before the indications for tonsillectomy are given, a few words will be devoted to the factor of age. It is known particularly from the work of Scammon, that the growth curve of lymphoid tissue is different from that of the body in general. Lymphoid tissue grows rapidly during the first six years of life and then tends to lag, so that the younger the child the more careful and conservative should be the opinion that such tissue should be removed. Large tonsils, after the age of six or seven years, are more likely to be infected, and their removal is more definitely indicated than at an earlier age.

The five indications for tonsillectomy are: (1) sufficient enlargement to obstruct the nasopharynx; (2) recurring acute follicular tonsillitis; (3) chronic enlargement of cervical nodes especially of the node at the angle of the jaw; (4) recurring otitis media, and (5) rheumatic fever, heart disease, pyelitis and other conditions in which the tonsils may act as foci of infection.

The first of these five indications is probably the most difficult to evaluate. Only when, on repeated examinations, the tonsils are so large that

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they produce symptoms of obstruction should they be removed. If obstruction is found at the end of a winter in which the child has had a succession of colds, the shrinkage in the summer months, when he is free from infection, may be sufficient to change the original opinion that the tonsils should be removed. The experience gained in repeated health examinations in schools has shown the error of recommending removal of enlarged tonsils which have been examined only once. As has been stated, tonsillar enlargement after the sixth year of life constitutes a much more definite indication for tonsillectomy in the absence of a recent acute infection than when the enlargement occurs before that age, but even when children have passed the sixth year it is not advisable to rely on a single examination.

The second indication for tonsillectomy, acute recurring follicular tonsillitis, is a rather simple one to determine because of characteristic recurring attacks of acute illness with high fever, leukocytosis, sore throat, malaise and headache. If the patient is seen early in an attack, there is only slight swelling of the tonsils, but within twenty-four hours the tonsils are large, red and covered with masses of follicular, yellowish-gray exudate which can be readily wiped off. After twenty-four hours there is also swelling particularly of the lymph node at the angle of the jaw, and within three to four days the temperature is down to normal but the youngster feels fagged out for a number of days. This type of infection recurs bi-weekly, monthly, or bi-monthly, and each time the same clinical picture is present. It may occur during the first year of life or at any time thereafter. It is usually caused by a hemolytic streptococcus. Two, or at most three, attacks are sufficient indication for removal of the tonsils.

It is important to distinguish between tonsillitis and the common recurring cold that usually starts with a stuffy nose, followed by a free discharge. Accompanying the cold there is usually a little tickle in the throat, only a little pain, and slight if any, fever. This picture is presented by many children each winter, and the disorder often ends up with a rather long drawn-out irritating cough. Repeated colds are not an indication for advising removal of the tonsils. In fact, this is the condition more than any other in which removal of tonsils may do harm; the recurring cold may develop, after tonsillectomy, into recurring bronchitis. Chronic colds, in themselves, are not indications for tonsillectomy.

Just as acute follicular tonsillitis represents acute infection of the tonsils, so the third indica-

tion for tonsillectomy, chronic enlargement of the lymph node at the angle of the jaw, represents chronic infection of the tonsils. By the expression "enlargement of the gland," I refer here not to mere palpability but to definite enlargement, and the commonly found tendency to variation in the size of the gland, depending on the amount of absorption from the tonsil. After watching a patient for a month or two, when, in spite of absence of new infection the gland remains large, I think it is advisable to remove the tonsils. In this connection tuberculosis of the nodes of the neck are a definite indication for tonsillectomy for the operation reduces very considerably the likelihood of break-down of the nodes.

The fourth indication for tonsillectomy is recurring otitis media. Almost any infection of the upper part of the respiratory tract may be complicated by otitis media, which, after running for ten days or two weeks, heals without further symptoms and without tendency to recurrence. This is the rule. With certain children, however, an acute cold is usually complicated by otitis media. It would seem probable that in such cases the adenoid tissue produces obstruction of the eustachian tube and the lack of drainage produces the abscess of the middle ear. Removal of nasopharyngeal lymphoid tissue (the adenoids) should under these circumstances do away with the tendency to recurrence of otitis media. In a number of cases in which adenoidectomy only was performed the otitis media recurred, and subsequent removal of the tonsils freed the patient from recurrence of infections of the ear. Because of these experiences I have advised removal of both tonsils and adenoids of children who have recurring otitis media.

The fifth and last indication for tonsillectomy is the presence of disease elsewhere in the body which may be the result of an infection of which the tonsil may be the portal of entry or focus. The most important of this group of diseases is the so-called rheumatic cycle, acute arthritis, endocarditis and chorea. However, pyelitis, nephrolithiasis, chronic rheumatism, and other conditions may be improved by removal of tonsils. By removing the tonsils, one does not, of course, remove all possible sources of infection, but it is generally accepted that in childhood the tonsils are one of the commonest sources of these various infections. Usually they should not be removed in the acute stage of the disease, but if the disease is rapidly progressive tonsillectomy occasionally is indicated.

Two weeks after recovery from an attack of
(Continued on Page 359)

State Control of the Feeble-Minded in South Dakota

Jesse H. Craft
Redfield, S. D.

ACTIVITY for state control of the feeble-minded in South Dakota has had two main periods. The First period was devoted to finding the feeble-minded and determining the extent of the problem. The Second period is in the beginning, and efforts are now being made toward a solution of the problem. The application of a remedy is now being made.

The First period began in 1925. At that time the State Commission for the Control of the Feeble-Minded began the mental survey of the feeble-minded. Two psychologists were employed to carry on the field work. These psychologists are specialists in mental testing and abnormal psychology. They were sent out to locate and classify the feeble-minded throughout the state. They have gone from county to county and have been over the entire state three different times. The penitentiary and other institutions have been included in this survey.

The psychologists find their cases through the reports of and consultations with teachers, doctors, nurses, welfare workers and officials; all of whom are required by law to report persons that appear to be feeble-minded.

The field workers do not wait until reports are voluntarily made. They go out and make contact with all persons who may be able to give information about cases. The school records have been especially helpful. A careful check-up for new cases is made each time the field worker goes into a county.

The classification of feeble-mindedness is made mainly through the use of the Binet-Simon Tests. The Stanford Revision of the Binet-Simon Tests is most commonly used. The Kuhlmann Revision of the Binet-Simon Tests is also used extensively, especially for individuals with language handicap and those who are not the verbal type. With these cases the non-verbal scale of the Kuhlmann-Binet is quite useful. Performance tests are used for the deaf, the Indians and the illiterate. The Hayes Adaptation of the Binet is used for the blind. The Intelligence Quotient (I. Q.) is invaluable in determining classification.

The classifications of the feeble-minded as based upon the Intelligence Quotient of the two principal tests are as follows:

Classification	Stanford-Binet I. Q.	Kuhlmann-Binet I. Q.
Idiot	—24	—24
Imbecile	25 to 49	25 to 49
Moron	50 to 69	50 to 74

To date the South Dakota State Commission has a registry of 4,730 feeble-minded. This number includes 605 patients at the State School and Home for the Feeble-Minded at Redfield; 101 feeble-minded who were examined at the South Dakota Penitentiary at Sioux Falls; 36 who were in the Training School at Plankinton and 23 who were in the various orphanages of the state.

A complete survey of the children of school age in the state has been made. The age span of "children of school age" includes the ages six to sixteen. This survey shows that 1.29 per cent of the children of school age are feeble-minded. The total number of feeble-minded for this group is 2,050. According to classification, 1,595 are morons; 358 are imbeciles and 97 are idiots. Of course the idiots had to be examined in their own homes or at the institution. Most of the imbeciles and some of the morons also were not attending school. The larger number of morons and a few imbeciles were examined at school.

Childhood is the age of proportionally higher mortality of the feeble-minded. It would seem that the years included in the complete survey of school children would give a higher per cent than could be found in a survey of the general population. It appears that it could be said that approximately 1 per cent of the population of the state is feeble-minded. That means that there are about 6,900 feeble-minded persons in the state.

Before any solution of a social problem such as that of feeble-mindedness can be worked out, it is first necessary to discover the extent of the problem. This was accomplished in the first five years of the survey in South Dakota. When the facts were presented to the legislature the laws for control were passed with very little opposition.

When the legal machinery was set up for

the control of the feeble-minded the State Commission found that it had a large number of feeble-minded already classified. There were reports on each individual case. These reports gave the location of the patients, personal data and case history and some medical history, if any, of each individual.

The Second period of activity has been directed toward the control of the feeble-minded. It was begun in July, 1931. Provisions for State Supervision and Control of the feeble-minded were made by action of the state legislature of that year.

The purpose of control is to prevent or check in every way practicable the propagation of feeble-mindedness. The purpose of supervision is to provide for the proper treatment of all feeble-minded persons in the state outside as well as in the institutions.

All authority pertaining to the feeble-minded outside of the institutions for the feeble-minded are vested in a State Commission for the Control of the Feeble-Minded and Sub-Commissions for the Control of the Feeble-Minded in the various counties of the state.

The State Commission is composed of three members appointed by the governor. The membership includes the superintendent of the State School and Home for the Feeble-Minded, who is ex-officio chairman, one lawyer and one physician. The membership since 1925 has not changed. Dr. F. V. Willhite, of Redfield; Judge Lewis Larson, of Sioux Falls, and Dr. G. S. Adams, of Yankton State Hospital for Insane, are the members.

Each county has a sub-commission. Its membership is identical with the board of insanity. It is composed of the county judge, the states attorney and a practicing physician, who is appointed by the county board of commissioners. The county judge in South Dakota is a qualified attorney at law. The office is non-political and has a term of two years. There is no limitation in the number of terms that the judge may seek re-election. Changes are seldom made in this office. The states attorney is elected by political party, and is limited to two terms of two years each. The physician is appointed for an indefinite term of office. Changes are seldom made and with the judge holding more or less unlimited terms of office there are usually two experienced members on the sub-commission from year to year.

The physician on the sub-commission has no special requirements other than that of Medical Doctor, and that he should be a "Prac-

ticing Physician." There are only a few available specialists in nervous and mental diseases in South Dakota. At the present time there is one psychiatrist and five or six members of sub-commission who have made some special study of the feeble-minded. It has been found that the less trained physicians are less likely to make a finding of feeble-mindedness in the case of higher grade feeble-minded. The physician's report usually determines whether or not an individual is committed to State Control.

The clerk of courts in each county also has an important function in the control of the feeble-minded in South Dakota. This office is the only marriage license issuing agency in the state. The clerk of courts in each county is furnished a list of all feeble-minded persons who are under State Control. He is forbidden under penalty of law to issue a license to any person named on this list.

In a recent report on control of the feeble-minded in South Dakota, Dr. F. V. Willhite stated that "to have control there must be: 1st, Identification; 2nd, Examination; 3rd, Registration; 4th, Supervision; 5th, Prevention (of marriage) and, 6th, Sterilization." The new law (Chap. 153, 1931 S. D. Session Laws) makes provision for these requirements. This law may be summarized as follows:

The State Commission—

1. Shall determine conditions under which the feeble-minded shall be permitted to remain outside institutions and when, and under what conditions they shall be committed to institutions.

2. Shall maintain a continuative census of the feeble-minded in the state.

3. Shall submit to the State Commission of each county for the purpose of investigation and commitment a list (complaints) of all feeble-minded persons believed by the State Commission to be feeble-minded.

4. Shall revise and submit supplementary lists from time to time as new cases are found

5. Shall file with the clerk of courts in every county a list of all persons found by the various sub-commissions to be feeble-minded.

The Sub-Commission—

1. Shall be responsible for the commitment, supervision and control of the feeble-minded in their respective county under rules and regulations provided by the State Commission.

2. Shall within thirty days after receipt of list submitted by the State Commission proceed to examine each person whose name is upon such

list and commit all persons found to be feeble-minded to the control of the State Commission.

3. Shall report immediately the findings of such examinations to the State Commission.

The Clerk of Courts—

1. Shall revise and supplement such lists as are submitted to accord with the State Commission.

2. Shall check all death certificates against lists presented to him and notify the State Commission of such deaths.

3. Shall not issue a marriage license to any party whose name appears upon such lists unless satisfactory evidence is furnished that one of the contracting parties has been sterilized or is otherwise incapable of procreation.

The above summary is only a general outline of the laws. It omits the details providing for its execution.

The sterilization law (Chap. 118, 1927 S. D. Session Laws) has had increased usefulness under the new law. The bringing of new cases before the Sub-Commission has revealed many cases where sterilization is needed that were formerly overlooked.

When the law for control went into operation the State Commission at once turned to its records and made a list of the imbeciles and low grade morons whose deficiencies were very apparent. This was planned as a beginning to avoid difficulty in determining the status of feeble-mindedness. There should be no question by the public generally that the findings of feeble-mindedness were correct.

A list was sent to each county in the state. At the time of this writing a second list has gone out to most of the counties. The State Commission plans to present a list of new cases that are found, to each county every year.

On February 1, 1933, the State Commission had submitted the names of 981 feeble-minded on lists to the various Sub-Commissions. The Sub-Commissions committed 910 of these cases to the supervision and control of the State Commission. The classifications of the feeble minded committed to state control are as follows: Idiots, 32; Imbeciles, 465, and Morons, 413.

The idiots are not considered an eugenic risk but are committed because they may need the protection that supervision offers.

Very few cases with Intelligence Quotients above 60 have as yet been submitted for commitment to state control. However, a few cases with I. Q.'s up to 69 have been committed

where the individual was a member of an outstanding feeble-minded family. Entire families have been committed.

The program of the State Commission is planned to include, eventually, the name of every feeble-minded person in the state for supervision and control. That is rather a large program. This program has been in operation for a year and a half. It will require at least a generation to put it into complete operation.

If we review our figures we find that 910 feeble-minded persons are under state control outside of institutions in South Dakota. There are 605 segregated in the institution for the feeble-minded. There is then a total of 1,515 that are virtually under state control. It is estimated that there are 6,900 feeble-minded persons in the state. We therefore find that 22 per cent are under state control. There are 4,730 identified and classified, or 70 per cent.

A complete registry and commitment of all cases to state control would not insure the prevention of procreation of all the feeble-minded. There are avenues of escape. Some will probably go into adjoining states to be married. There is the possibility of promiscuity. The remedy for such evasions is compulsory sterilization. The laws of South Dakota make sufficient provision in this matter. How well cases are to be followed up and action taken to head off these evasions remains to be seen.

Sterilization was begun in earnest in January, 1929. At that time the new hospital was opened at the State School and Home for the Feeble-Minded. This hospital for the first time provided adequate facilities for operations at the institution. Previous to this time 16 sterilizations had been performed for the institution at a private hospital.

Since the sterilization law for the feeble-minded has been in operation 53 vasectomies and 87 salpingectomies have been performed, or a total of 140. Of this number the operating staff has had the consent of the parent, spouse or guardian of 78 of the patients.

There have been 20 sterilizations for cases classified as "sex offenders," one of which was a male. Twelve of these cases were unmarried mothers. Thirteen married women and four married men have been sterilized.

Before the law for the control of the feeble-minded went into effect most of the sterilizations were performed upon patients who were at the time inmates of the institution for the feeble-minded. During the past year most of

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Resuscitation of Babies Stillborn by Direct Injection of Adrenalin Chloride into Heart Musculature

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MEDICAL literature contains but few references to the resuscitation of babies, apparently stillborn, by direct injection of a solution of adrenalin chloride into the musculature of the heart, although the value of this drug used in this manner has long been known and frequently used in the resuscitation of adults in various conditions. What few reports have been made in its use in apparently stillborn babes show a high rate of failure or mortality, the average being about eighty per cent.

In the twilight of my professional life while reminiscing over the past half-century and more spent in the general practice of medicine, most of which has been spent on the prairies of North Dakota, I thought a few personal experiences during the past few years might be of general interest to the medical profession.

CASE REPORTS

Case 1—December 25th, 1925, male child, full term, born to Mrs. F. A. M., multipara, following normal labor, without anesthesia in any form or hypodermic sedatives. Child stillborn to all appearances, signs and symptoms. Cord pulseless, no ocular response. Traction of tongue revealed no signs of life or beginning respiration. No response to artificial respiration, bath immersion, alternate hot and cold applications, massage of cardiac area, mouth to mouth inflation of lungs or other approved methods of resuscitation. Heart sounds were inaudible on auscultation with stethoscope. No bleeding from cord on its ligation. After all above tabulated efforts had failed of resuscitation and the necessary lapse of considerable time ten minims of 1:1000 solution adrenalin chloride was injected direct into the musculature of the left auricle. The response was almost immediate and within two minutes the child was breathing freely. This child has waxed fat and grown strong and is attending public school today and normal in every respect.

Case 2—June 6, 1930, female child, full term, born to Mrs. F. M. Child well nourished, of

medium weight and development. No signs whatever of animation. Heart beat, cord pulsation, ocular reflex, etc., all negative. Placenta loose but not expelled. After resorting to all known methods at my command for fully thirty minutes and still no signs of life, I injected ten minims of 1:1000 solution of adrenalin chloride into musculature of left auricle and resumed physical methods of resuscitation. After ten to fifteen minutes (it seemed like two weeks) the child gave a faint gasp and later commenced normal respiration. Child is still living and normal in every way.

Case 3—October 6, 1932, male child, weight six pounds, born at eight months term to Mrs. R. J. Cuticle but partially developed and no hair or nails. Placenta delivered spontaneously immediately following birth of child. No physical signs of animation. Usual methods of resuscitation employed for twenty-five minutes after which ten minims of 1:1000 solution of adrenalin chloride was injected direct into the musculature of the left auricle. Artificial methods of resuscitation were continued and after fifteen minutes my efforts were again rewarded with a faint gasp by the child and finally complete resuscitation. Today the child is thriving and normal in every way.

During the past seven years two other cases of similar nature have presented themselves and after all physical efforts at resuscitation had failed adrenalin chloride has been resorted to in the manner described for the three cases but without results.

All of these babes have been delivered in private homes and I was not favored with trained personnel, physician or nurse to assist me.

CONCLUSION

The hypodermic injection of a 1:1000 solution of adrenalin chloride direct into the musculature of the heart in the resuscitation of babies, apparently stillborn, is a safe procedure and in many instances will be rewarded with the resuscitation of the child.

Syphilis—An Individual Health Problem*

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THE name syphilis was first used in a poem called "Syphilos" by Fracastoro, a Venetian physician, in 1530. Little did he think when he wrote this poem that he was giving to this disease a name which will live forever.

For centuries syphilis has been one of the major causes of illness and of death in all the civilized world; but even so relatively little effort has been made to control or eradicate it. Most physicians accept as in general correct the reports which they read about the incidence of this disease but they are apt to feel that in their particular practices it is so rare that they need to consider it only when they find suggestive symptoms. Yet every physician knows that syphilis exists with varying degrees of frequency in every social and economic group and that, untreated, it will progress just as rapidly and just as inexorably in a king as in a pauper.

Historically, syphilis is a disease of unusual interest for it does not appear to have been recognized by physicians until about the end of the fifteenth century. In February, 1495, the army of Charles VIII of France conquered Naples and during the occupancy of the city a large proportion of the soldiers contracted syphilis. Upon returning to their native lands these soldiers infected not only their own countrywomen but also women of the countries through which they passed. This was the beginning of an epidemic of syphilis which spread throughout Europe and then all over the civilized world where it has persisted to the present day.

The source of syphilitic infection in Italy at the end of the fifteenth century has been a subject of much controversy. Some of the students of medical history believe that Columbus' sailors contracted it in Haiti and upon their return home introduced it into Italy. Hence by some syphilis has been called one of America's contributions to Europe. Others believe that syphilis in a mild form had been present in certain sections of Europe for a long time and that its spread and increase in severity merely happened to coincide in point of time with Columbus' visit to America.

The communicability of syphilis was recognized

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early but for a long time it was believed to be spread by contagion. In fact, Henry VIII was said to have contracted it from Cardinal Woolsey whispering in his ear. Prior to the use of the name syphilis, each country blamed the disease on its most unpopular neighbor and named it accordingly; the French called it the Italian disease; the Italians and English called it the French disease; and the Russians called it the Polish disease.

The manifestations of this disease in the human body and the symptoms with it may produce are so numerous and varied that it is frequently said that in every indefinite illness syphilis should be considered a possible diagnosis.

The germ which causes syphilis was discovered by Schaudinn and Hoffmann in 1905; a blood test which indicates the presence of the infection in the body by Wassermann in 1906; and a specific and effective method of treatment by Ehrlich in 1910. As a result of these and other investigations, we now have sufficient scientific knowledge to prevent practically all of the invalidism and deaths produced by the disease. We know its cause and the manner in which it is transmitted. We can identify those who are infected and we can cure all in whom the disease has not become too far advanced. Certainly one could not ask for more effective scientific measures of control than we have available against this disease; and yet we must admit that relatively little progress has been made against it.

The reasons that more has not been accomplished toward the control of syphilis are many but probably the greatest obstacles have been lack of information on the part of the public concerning the facts of the situation and emotionalism growing out of the moral aspects of the problem. The moral considerations have interfered with clear thinking on the subject and ignorance has prevented practically any thinking at all. The results of such influences are illustrated by the comments of a recent governor of one of our states as he struck from an appropriation bill the request for funds for the control of venereal diseases. His remark was that he did not believe that venereal diseases were nearly so prevalent nor so important as health officers claimed and that, even if they were, he was

opposed in principle to the expenditure of public funds to control diseases which were contracted through immorality and probably were intended as a punishment for wrong-doing. Such thinking is neither humane nor economically sound, for the budget of his own state showed that the amount of state funds spent each year to provide board, laundry and custodial care for persons permanently incapacitated by syphilis was more than five times as large as that which was requested for the control of the disease. Such economy is short sighted and costly because when this disease is allowed to progress society always pays and pays dearly for the support of the wrecks of humanity which it produces.

The exact number of persons in the United States suffering from syphilis is not accurately known but a careful estimate made by the United States Public Health Service and the American Social Hygiene Association indicates that there are about 650,000 persons under treatment at a given time and that about 425,000 new cases are diagnosed each year. Most of these cases are in the late stages of the disease, a time when the possibilities of complete cure are distinctly reduced.

The costs of this disease, both social and economic, are appalling, with the burden falling heavily upon the family, upon industry, and upon society. Upon the family the effects of syphilis are particularly tragic. Usually the husband is the first to contract the disease but soon the wife becomes infected, and miscarriages, still-births, or children stigmatized by congenital syphilis results. As the disease progresses the husband frequently is unable to work and the whole family becomes destitute and dependent.

Industry and business also are concerned because of the inefficiency and disability to employees. A relief department of a railroad company which had 300 employees examined because of prolonged disability discovered that 12 per cent of these had syphilis. The cost to the company which had been carrying the compensation of these men was almost \$50,000.00. Another corporation found that 68 per cent of the "non-effective" employees were on the sick list because of syphilis or gonorrhoea and that these employees lost on the average three times as much time from work as those who were not infected. Serious industrial accidents and wrecks of public carriers such as buses and trains have been traced to employees whose efficiencies were lowered and whose senses were dulled by advanced stages of syphilis.

Society too must pay its share, and a lion's

share it is, because of the many persons who become incapacitated and destitute because of syphilis and must be cared for at public expense. Between 10 and 15 per cent of the persons committed to our state psychopathic hospitals are sent there because of general paresis. In other institutions also we find wards of the state who are blind, feeble-minded, delinquent, criminal, or physically incapacitated because of this same disease. Most of these unfortunate people do not live on in institutions for many years, but even before death sets them free their places are needed for others, some of whom they themselves have infected.

Realizing the importance of syphilis as a health problem in the general population, the staff of the Student's Health Service of the University of Minnesota raised the question several years ago as to whether the proportion of University students infected with this disease is sufficiently large to justify the inclusion of the Wassermann test as a routine procedure in physical examinations. The decision was to include the test routinely for a period of time and then to decide on the basis of results whether it should be continued. After this testing had been carried on for a period of three years, the results of the first 5000 tests were analyzed and it was found that they had led to the diagnosis of syphilis in ten students. This represented a ratio of one case of syphilis in each five hundred students, two-tenths of one per cent, much less than any would have anticipated. At St. Louis University, where similar tests have been performed for the past two years, the percentage of positive reactions had been three-tenths of one per cent.

Other Wassermann surveys have shown reactions positive for syphilis varying from 0.6 per cent in 3,700 candidates for the Aviation Corps to 97 per cent in 310 prostitutes. Most examinations of supposedly healthy men, however, have shown positive reactions ranging from two per cent in 9,000 persons examined by the Life Extension Institute, to 17 per cent in 1,019 recruits of the United States Army who had been in the service less than one week. Among women the percentage of positive reactions has been somewhat lower, ranging from 2.5 per cent among pregnant women of Baltimore to seven per cent among pregnant women of Edinborough. Recently two physicians of Indianapolis reported that in 2,872 consecutive Wassermann tests on private patients who came to their offices for physical examination, 105 posi-

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Is There Any Truth In Anti-Vaccination?

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IT IS said that every movement or religion now existing probably has some truth in it, and the longer it lasts, the greater is the probability. The Anti-Vaccination movement has existed a long time, practically from the very year that Jenner wrote his memorable paper, 134 years ago. It would seem possible, therefore, that there is some hidden truth in Anti-Vaccination.

To try to find this buried principle, it was found necessary to wade through the many so-called claims and proofs against vaccination as presented by the anti-vaccinationist. But it was found that nearly all of the anti-vaccination propaganda is but emotional rhetoric oozing from the vague fogs of chiropractics, naturopathy, osteopathy, faddism in sanitation, physical culture, dietetics, and spiritualism. There was found no hidden principle in all this. Moreover, such propaganda is of great commercial value in urging the sale or adoption of that particular advertised cure-all medicine or muscular appliance, physical culture magazine or handbook, vegetarian restaurant or cult. The business-getting power of such propaganda used as an entering wedge for making a sale may be largely responsible for the persistence of the anti-vaccination movement.

Not all persons who protest against vaccination have a money interest in the subject, for the sincerity of some of these is not to be doubted. One may simply question the quality of their mental equipment. A few of these people have really been exposed to considerable education in other things, but because of some mental twist or emotional complex they have entered the militant ranks of the anti-vaccinationist. But in order that these people would believe this credo, they must have found in their daily observation and experience that at least one claim or proof as advanced by the anti-vaccinationist is true, or appears to be true, and they have then accepted the entire portfolio of claims as true.

It was decided to search further. The various claims were listed after delving into anti-vaccination articles and pamphlets. One by one, the claims were crossed out as they seemed evidently irrational and illogical. Finally, only those re-

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mained that seemed to have had some real thinking behind them. There was only one claim that seemed to have any particle of truth in it: "Whatever smallpox was in the past, the disease now called smallpox is a trivial malady, and may be ignored as is chickenpox; vaccination is worse than the disease it is supposed to prevent." I believe here is that hidden principle that intrigues the mind of the layman and causes him to listen favorably to the other dogmas of anti-vaccination. This claim is used by the anti-vaccinationist more frequently than any other.

It does seem to be true that most smallpox cases are less severe now than formerly. We have all seen epidemics involving from ten to a thousand people without many deaths. The disease is exactly like smallpox except that the sickness is not so severe.

The layman has also noticed that these epidemics are mild. He sees that the health officer of his city starts an intensive vaccination program, yet few, if any, unvaccinated persons die from smallpox. As a result, the layman approves the statement of the anti-vaccinationist that either the doctors do not know what they are talking about on this subject, or smallpox has become very trivial and unimportant. In fact, he believes that vaccination is worse than the disease it is supposed to prevent. As his premise in this line of reasoning, the anti-vaccinationist has added to the fact that smallpox is now often mild the assumption that smallpox has permanently changed to this mild disease. It is no wonder that when he starts with such a false premise, he comes to such a conclusion.

If one could believe that this mild form of smallpox always bred true and so remained mild, we could regard it as a different disease. Practically, it would be rather hard to distinguish in every instance the mild cases as belonging to either the mild disease or the classical one, because in every epidemic some of the mild cases give to others a rather severe illness, while in an epidemic of classical smallpox there are many mild cases derived from the more severe cases. If the mild disease is declared a separate entity, the question will then arise, shall we or shall we not quarantine this particular case?

There are some medical men, chiefly found in England, who believe that this mild smallpox breeds true to type and never reverts to the classical, severe form. They contend that it is a distinct disease and should have another name. These people have designated themselves "Dualists." They further say that no proof has been brought forth to prove that the mild smallpox ever reverts to the confluent and hemorrhagic forms with high mortality.

On the other side of the controversy are the "Unicists," who believe in the present official view that the two diseases are but one disease, and the mild type gradually, or more or less suddenly, becomes the severe classical smallpox of history with a high mortality. The only difference between the two types of this disease is that the mild one happens to be less virulent and does not breed true but does revert.

The crucial question then presents itself: Does the mild type ever become virulent?

The Dualist says that there is no evidence to prove that it does so. And when we try to look up the matter in the medical literature, we find little mention of this important point.

The Unicist says that it must be the same disease, because vaccination protects against both, and the one disease, once had, protects against the other. But the Dualist laughs, and says that vaccination is actually a test to distinguish the one disease from the other. Although both diseases give an "immune reaction" on vaccination shortly after recovery, the mild disease will allow a true "take" after one year, whereas the classical smallpox will give an immunity practically for life.

To my mind, failure of the mild disease to give an immunity lasting longer than one year does not necessarily prove that the mild disease is a separate entity. It is generally true of all diseases that the immunity following it is largely dependent on the severity of the attack of that disease. Nor have the Dualists presented a convincing study of many cases to prove that vaccination is so clear-cut in differentiation after one year. A mild attack of smallpox would be expected to give but little immunity as compared to the severe classical attack of the disease. It does seem as though those people who have a severe reaction, or are vaccinated at several places on the body at one time, have a greater and longer-lasting immunity when vaccinated with cowpox than do others,

Text-books for many years have spoken of "Variola Minor" and of "Variola Major," a very good classification based on the idea that the

two are types of the same disease. We could define Variola Minor as a mild form of smallpox causing death only at the extremes of age or when there is some other serious disease already present; does not have hemorrhagic or otherwise toxic severe cases, and vaccination protects against it for about ten years and re-vaccination for another twenty years. Variola Major would be defined as a severe form of smallpox, often having a twenty per cent mortality, frequently having hemorrhagic and very toxic cases, especially after the disease has been intensified by several generations of transmission, and against which vaccination will protect about seven years and re-vaccination an additional ten years.

If it is true, as superficial observation seems to indicate, and as is maintained by the Dualists, that the mild type remains always mild, then our quarantine procedures could be changed. There would be no object in enforcing severe quarantines if the disease is really so mild. Such quarantine becomes a serious economic problem when patients and contacts are kept from work a long time. As far as the writer is concerned, the only quarantine measure of real value is the vaccination of contacts. If everyone is vaccinated, there is no object in trying to separate these two types into two diseases, at least from a public health standpoint. The Dualist says when smallpox appears in a city, the health officer can warn the city without designating the type, and if, after five to seven weeks of the epidemic, no severe confluent or hemorrhagic cases have appeared, and no fatalities, he can declare the epidemic to be of the mild type, and quarantine control can be practically lifted. One severe case or a death would make the diagnosis of classical smallpox for the entire epidemic.

Since we today believe that every mild case of smallpox is potentially able to give virulent smallpox to others, we must regard a mild case with suspicion. But creating a great deal of alarm over the mild form is somewhat like the child in the story who called "wolf" once too often. We must make it very plain that it is not the mild form we wish to prevent, but the severe form, of which it may be the progenitor. If people do not become vaccinated after we have urged them to do so, the blame of future deaths from smallpox must rest with them and with the anti-vaccinationists who have misguided them.

Naturally, we want everyone to be vaccinated to prevent a virulent epidemic of smallpox. Vac-

cination in this respect is very much like an insurance policy. Very few will deny that the discomfort of vaccination is but a very small premium to pay against the most disfiguring and loathsome communicable disease affecting man. As in other forms of insurance, the premium must be paid at intervals to secure adequate protection (re-vaccination). But one can hardly expect an individual who has been led to believe by anti-vaccinationist propaganda that smallpox has become permanently mild to pay the same premium. In consequence, it is becoming harder to convince people that they should be vaccinated.

When the anti-vaccinationist says that smallpox is a very mild disease, we agree by saying that it often is. But when he says that smallpox has permanently become mild and is no longer a dangerous disease, we can not agree. All we have to do is to recall the terrible state-wide epidemic of 1924 and 1925, when the case fatality rate was 26 per cent in the city of Minneapolis, and about 20 per cent for the state. This was only a few years ago, and it can happen again soon. Since thirty per cent of the school children in the city of Minneapolis are not vaccinated, a city very active in public health work, over fifty per cent of the rural school children in the state are probably not vaccinated. There is a large unknown percentage of the general adult population, also not vaccinated. Conditions are certainly ripe for an epidemic of smallpox should the virulent type of organism make its appearance. When the anti-vaccinationist says that vaccination does not protect one against smallpox, let him look over the authentic figures as found in the November, 1932, issue of *Minnesota Medicine*, and he will find that not once during the entire recorded history of the state of Minnesota has a person died from smallpox who had been properly vaccinated within seven years. This statement excepts the case of a boy with Hodgkin's Disease who had been given but one year to live.

When we stop to consider that in any epidemic of classical smallpox there are all grades of severity from the mild to the fatal case, we must realize that the variations in severity are due to the immunological differences of the individuals. We know that people vary a great deal in their power to resist disease, but if in an epidemic of a disease all cases are mild, we must come to the conclusion that the mildness of this epidemic is not due to individual variation, but to the inherent mildness of the causative organism itself. That is simplicity itself. But then to go

on to infer that because the epidemic is so mild it must therefore be another disease, as the Dualists insists, seems to be rather poor logic without other proof. The anti-vaccinationist carries the idea still further by declaring that smallpox has become permanently mild, and that severe smallpox no longer exists, despite the fact that people are dying of smallpox in this and other countries at the present moment.

If the mild strain of smallpox breeds true, it is undoubtedly a transmutation, a permanent change to a mild type. The permanency of this change has yet to be proved. The fact (?) that a mild strain has evolved from the virulent type does not mean that the virulent strain has disappeared, as the anti-vaccinationist presumes. We have the old severe type as well as the new, and we still need protection by vaccination.

Other diseases act in much the same way. Epidemics of measles have been reported with a mortality rate of fifty per cent. Measles has frequently caused more deaths than either scarlet fever or diphtheria. Yet during the first two months of this year, Minneapolis had four thousand five hundred cases of measles reported (about six thousand cases probably existed) with only one death. During this mild but large epidemic, we have felt that the disease would continue to breed true to the mild type. But we could scarcely say that because the disease is so mild the epidemic is not after all one of measles, but is another disease.

The virulence of the present measles epidemic seems to be gradually increasing. Children stay out of school because of measles longer now than they did at the beginning of the epidemic. Complications are becoming more numerous and severe. There were four deaths in the first two weeks of March. After many bacteria-generations of transmission, gradually increasing in toxicity, the causative organisms may be carried to some distant community where the disease may appear out of a clear sky without a preceding mild stage as a virulent epidemic of measles. In comparison, the disease may be so virulent as to lead some to believe that it is a different disease. Need one say that the same thing probably occurs in smallpox?

It now becomes evident that the purpose of this paper is not to "ride" the poor anti-vaccinationist, but to present this problem of the relationship of mild smallpox to classical smallpox. The time may come when one of us may be in the midst of an epidemic of smallpox of the mild type. Without having had this problem presented, we would probably not think of mak-

ing such an epidemic a scientific experiment to study this relationship. In making this experiment, one would be most interested to learn if there is a change from the mild to the severe type. After such an epidemic, one should test out the contention of the Dualists that the immunity following the mild type lasts only one year.

From a public health standpoint, it makes no difference whether the mild disease is proved to be a definitely different disease without fatality or not, because it is the classical type of the disease which still exists that we wish to prevent. The main thing is that some definite conclusion shall be reached, for a definite conclusion will remove all doubt as to the purpose of vaccination, that purpose being protection against the severe, classical type of smallpox with fatalities.

Until it is proved that mild smallpox is a different disease, we must continue to believe that mild smallpox may become virulent at any time. Therefore, everyone should be protected by vaccination. This paper wishes to emphasize what appears to be a very trivial idea, to let the layman know that we know that smallpox is often mild, but that it does not always return to us in the mild form. We must remind him of the fact that virulent smallpox once started as an epidemic is a horrible disease.

Since the anti-vaccinationist has taken a half-truth (the present mildness of smallpox) and added to it an untruth (that fatal smallpox has permanently disappeared) to make a premise, he has created a no-truth, and since no other truthful premise could be found, there can be only one answer to the question "Is there any truth in Anti-Vaccination?" That answer is "No."

In closing, the writer wishes to apologize to the medical reader in having to dissertate upon a subject so evident. But it is not so obvious to the layman, especially one lulled to sleep by the soporific chantings of the anti-vaccinationist that "All is well—leave well enough alone."

SYPHILIS—AN INDIVIDUAL HEALTH PROBLEM

(Continued from Page 346)

tives were discovered, 2.65 per cent of the group. Of these patients 1,084 were men and 1,788 were women. Among the men the incidence of positive reactions was 6.08 per cent and among the women, 2.18 per cent. According to the report these persons "were of the well-to-do and middle class in about equal proportions." A Wassermann survey of negroes in rural Mississippi revealed positive reactions in 23.6 per cent of

the men and 24.3 per cent of the women.

In view of the small proportion of students infected the question arises as to whether it is worthwhile to continue the test routinely in their examinations. The answer, however, is not difficult if one reviews the cases of the ten students in whom the test led to a diagnosis of syphilis. Five of these students were boys and five were girls. Except for one who had been somewhat promiscuous sexually, the group was not an immoral one but consisted of rather average young men and women. It was difficult to be certain how many of the infections were congenital but probably at least half of them were "innocently" acquired, being either congenital or accidental. The health of these students at the time of the examination was good although several had had indefinite symptoms which probably were due to unrecognized latent syphilitic disease. In one student, much older than the others, the disease had progressed to such a degree before diagnosis that in spite of treatment and hospitalization, death occurred within a year from general paresis. The other students, however, were placed under treatment at a time when the disease was still curable and health could be preserved. Untreated, in these also the disease would have progressed insidiously until in one, five, ten or twenty years it would have reached such a stage that chronic illness, mental and physical, would have made death a welcome release from life.

Can such results leave any doubt as to the value of continuing this test? And if it is worth doing in university students, how much more worthwhile it is for the general population in which the proportion of infected persons is at least ten times as great as it is in this group of students. Some few physicians have been using this test routinely in their health and physical examinations but more frequently they hesitate to include it because certain persons object on the grounds that its use carries an implication of doubt concerning their moral standards. Intelligent, thinking people, on the other hand, are beginning to view this disease as they do any other illness and not only welcome the test but actually insist upon having it. Physicians, however, should lead the way by making this test a routine procedure in every physical examination.

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Fractures of the Jaws*

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PART II. FRACTURES OF THE MANDIBLE (Continued)

FRACTURES OF THE MAXILLA, MALAR BONE AND ZYGOMATIC ARCH

FRACTURES OF THE CORONOID PROCESS

FRACTURES of the coronoid process are rare and show but slight tendency to displacement unless the impact, such as the force of a bullet, has driven the fragment from its position. Occasionally a coronoid fracture is combined with a displaced fracture of the malar bone and scar tissue formation may result in an extra-articular trismus or ankylosis. This may necessitate the excision of the coronoid process in order to permit the free opening of the mouth. Foreign bodies, such as windshield glass, may be present in the region of the coronoid and zygoma. (Figure 9.)

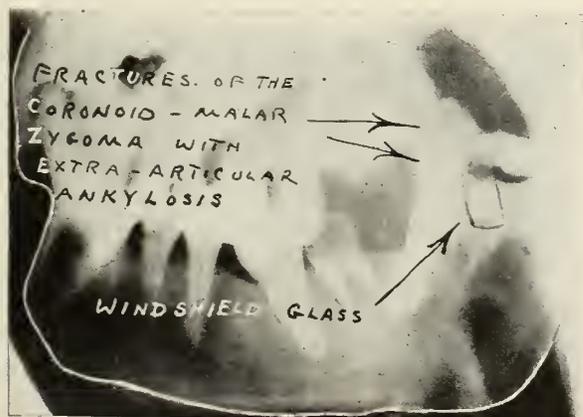


FIGURE 9

Lateral jaw film, ramus position showing fractures in the region of the tip of the coronoid process and zygomatic arch. A small piece of windshield glass is seen beneath the arch.

FRACTURES OF THE CONDYLE

Fractures of the neck of one or both condyles are not uncommon; they are usually combined with fractures of the angle, the bicuspid region, or symphysis. The Postero-Anterior and Ramus Lateral-Jaw Pictures (Figure 10) may show forward displacement of the lower portion of the condyle fragment with apparent over-riding and foreshortening of the ramus. In some

instances the P. A. views will seem to show an external rotation of the neck of the condyle with apparent separation of a least 1 cm. between the fractured ends of the bone. These apparent, marked displacements are misleading, for in most instances the wiring of the teeth in occlusion is followed by adjustments that will result in a good strong union and normal function of the parts. Some authors have recommended operative interference, open reduction and direct surgical wiring in these cases. I have not carried this out, and note that Ivy and Curtis¹ in their recent textbook feel that such a procedure is unnecessary. Kazanjian² also feels that good results are attainable by wiring the jaws to normal position. He tried the open reduction method in three or four cases and every one of them was a failure. Where there is an extreme displacement of the neck of the condyle, it can often be manipulated and held in a more satisfactory position by a pad and bandages or by a spring pad from a head cap. In unilateral condyle fractures with over-riding, Ivy recommends the insertion of a thin strip of gutta-percha between the molars on the affected side before wiring the teeth in occlusion. This tends to correct the over-riding of the fragments; and after union takes place, there is less tendency for the jaw to swing towards the affected side when the mouth is opened.

FRACTURES OF THE EDENTULOUS MANDIBLE

Fractures of the edentulous mandible may occur in any part of the body, angle, ramus or neck of the condyle, and may be multiple. Fractures through the edentulous jaw may be of the simple non-communicating type, or may penetrate through the mucosa to become compound. Displacement and mobility may be almost negligible or quite marked. The artificial dentures worn by the patient may be utilized to steady the parts (Figure 11, A); and the mouth is held closed in a normal position by the use of bandages, such as the four-tailed or Barton bandage. The *Acc* bandage, elastic weave, is very useful for this purpose. With care on part of the patient and the use of liquid and very soft food, a satisfactory union may be anticipated. If the margins of the lower denture are some-

*Read before the Hennepin County Medical Society in joint meeting with the Minneapolis District Dental Society, March 6, 1933.

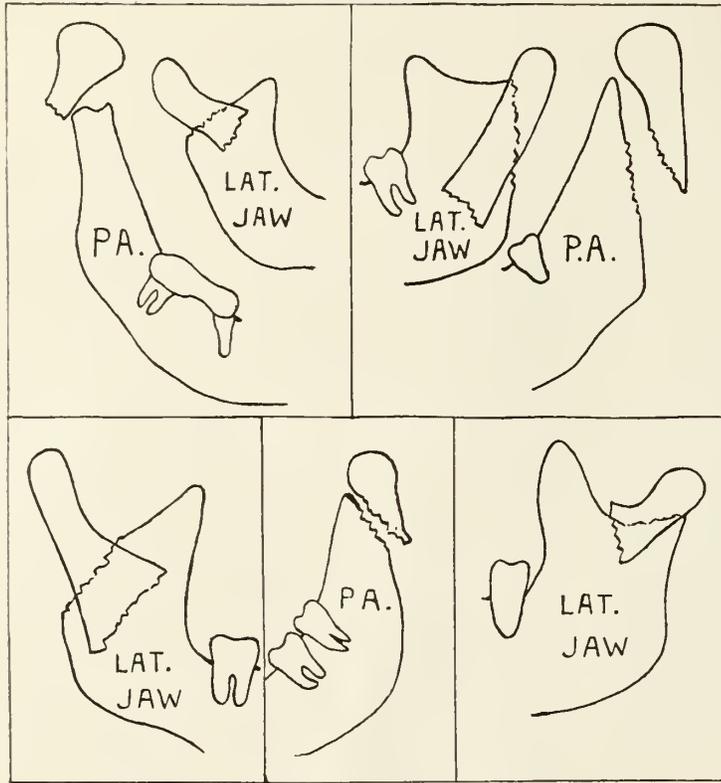


FIGURE 10

Tracings of X-rays of fractures of the condyle, postero-anterior and ramus positions. The marked displacements, rotation and separation shown are exaggerated for wiring the teeth of the upper and lower jaws together in occlusion is followed by union with good function. No joint disabilities have been observed nor complained or by the patients even when further X-rays show union with a persistence of the apparent displacement.

what sharp it is often necessary to trim them back in the area corresponding to the fracture and reline the under surface with gutta-percha or dental impression compound. This permits accommodation of the denture base to the swelling at the site of fracture. If no artificial dentures are available it may be necessary to construct splints (Figure 11, B and C). These splints are best made in a slightly open bite position. For this purpose vulcanite is very serviceable. In the event that these measures do not control the mobility and hold the displaced fragment of the jaw and particularly where there are bilateral fractures in the bicuspid region with a dropped central fragment, the method of circumferential wiring and splint

fixation is indicated. Impressions are taken of the separate portions of the lower alveolar ridge; and these are assembled in a satisfactory relation with a cast of the upper jaw. Alveolar cap splints are then made extending slightly deeper lingually than would be permissible with a lower denture. The fractured parts are drawn up tightly into the splint by means of wires that pass around the jaw outside of the periosteum. The circumferential wires are inserted by means of an antrum trocar and canula which is passed close to the periosteum from the mucous membrane of the mouth to a small incision made beneath the chin. Ordinarily, three wires inserted in this manner are necessary to hold the fragments in a good position. By tightening the

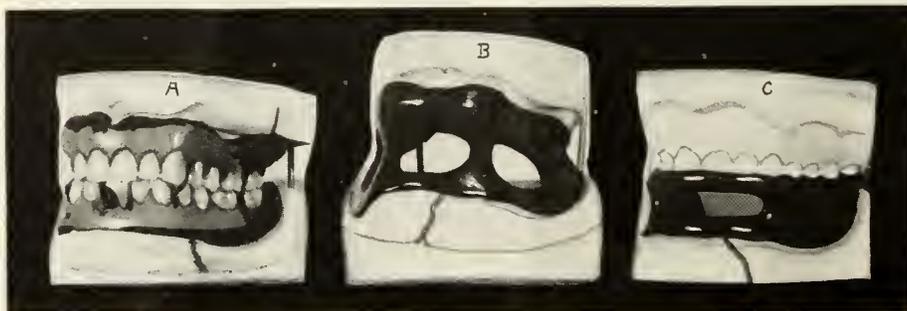


FIGURE 11

Methods of controlling fractures of the edentulous mandible: (a) Artificial teeth wired together with the removal of lower incisors to facilitate feeding. (b) Double gunning alveolar ridge vulcanite splint. (c) Gunning splint made to fit the teeth of the upper jaw as well as control the alveolar process of the mandible. In addition to these appliances it is necessary to bandage or otherwise support the lower jaw up in correct position.

Fractures of the Edentulous Mandible . Extra periosteal circumferential wiring with alveolar cap splint fixation .Used to reduce displaced fragments and maintain correct position .

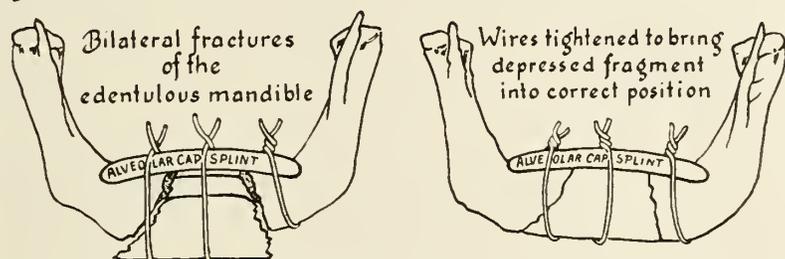


FIGURE 12

Extra periosteal circumferential wiring over an alveolar cap splint. The wires are inserted by means of a small curved antrum trocar canula. This method is also of service in fractures with teeth present where displacements recur and other methods fail to hold the fragments.

wires over the splint the displaced fragment is pulled up into the splint (Figure 12). This wiring placed extra-periosteally does not have any such hazard of bone infection with danger of resulting necrosis and perhaps ultimate non-union, as is the case where one employs direct surgical fixation by drilling into the ends of the fragments and wiring across the line of fracture. It may be noted that circumferential wiring and splint fixation is also of great value in certain fractures where there are teeth present but where other methods might fail to hold the fragments. It must be noted that it is advisable to steady the mandible in a position of occlusion by means of wiring or external bandaging. Kazanjian² advises the surgical exposure and wiring together of the ends of over-riding displaced edentulous fragments through incisions within the mouth. He states that there is surprisingly little post-operative reaction. The wires are removed in four weeks.

NON-UNION AND BONE GRAFTING

Non-union is rare in civil fractures. Severe traumatism, comminution and infection may, however, lead to the death and loss of a segment of bone with resulting non-union. The remaining portions should be maintained in as nearly a normal position as possible until time for bone grafting which should not be undertaken until at least six months have elapsed after all sinuses have healed. The iliac crest is the best donor bone for bone grafting of defects of the mandible. It has proven to be most satisfactory from every standpoint (Figure 13).

FRACTURES OF THE MAXILLA

Fractures of the upper jaw are of three general types. 1. Those involving a section of the jaw to include the alveolar process without a severance or displacement of the remaining portions of the jaw. Such a segment may be impacted in the re-

maining portions of the jaw and present displacement without mobility. This type of process fracture may be combined with the second or third type of fracture. 2. Fractures of half of the upper jaw, the remaining half of the upper jaw being intact. These unilateral fractures may or may not show considerable mobility and present various degrees of displacement or over-riding. 3. Complete fracture of the major portion of the upper jaw, both sides. Occasionally a portion of one tuberosity carrying a molar tooth may remain in solid continuity with the other bones of the skull. These fractures usually show mobility and displacement, frequently presenting an open bite with the anterior portion quite loose whereas the posterior portion, the molar region, resists replacement.

As already noted, segments of the alveolar process may present varying degrees of mobility and may be in a reasonably correct position or be considerably displaced. In all such fractures



FIGURE 13

Iliac crest bone graft for non-union of fractures in the symphysis and bicuspid region.

including the impacted fractures, it is necessary to make a careful diagnosis of the dental condition of both jaws or at least the upper jaw before fully determining the procedure to be instituted. In many instances the ultimate dental restoration indicated such as bridge work, partial or full dentures may be a factor in determining the method of treatment. Carefully taken dental X-rays including the occlusal (bite plane) rays are necessary in order to find out the direction of the lines of fracture as well as the presence of fractures of the teeth or root ends.

In the case of mobile segments of the process where it is hoped the teeth may be retained, it is best to manipulate the fragment into correct occlusion and there retain it. For this purpose an open occlusion splint fixing the fragment to the remaining teeth of the maxilla may be suf-

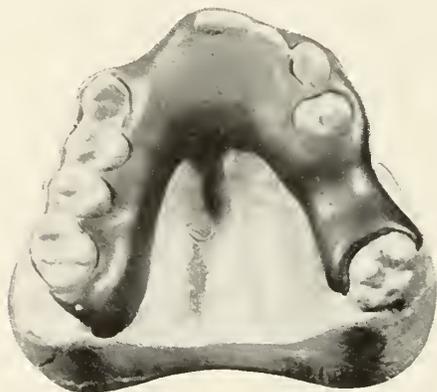


FIGURE 14

Vulcanite and buccal bar splint for the retention of a fractured segment of the alveolar process of the upper jaw.

ficient (Figure 14) or an external arch bar may be applied to which the teeth of the fractured segment may be wired. In many cases such procedures do not prevent some slight traumatism of the fractured segment during mastication and it is better for at least a week or two to close the mouth in occlusion and thus afford complete rest to the fractured area. After two or three weeks have elapsed there will usually be sufficient union to permit the mouth to be opened and the fracture to maintain its position by an external splint or an arch bar.

Fractures of half of the upper jaw with mobility can usually be nearly if not completely reduced by manipulation. In most cases they should be maintained in correct occlusion by means of firm wiring of the teeth in occlusion on the uninjured side. Two or three days of adjusting and tightening of the wires may be required to secure the teeth of the fractured side in good occlusion. For this purpose where considerable force is necessary, overlapping loop

wiring is of great service. In addition to the wiring of the upper teeth to the lower jaw, the wiring together of the teeth on either side of the fracture may be indicated to give a finer adjustment to the ends of the fragments and to secure a more normal contact point. At times there may be an over-riding of the bony margins of the fragments in the middle line of the palate and an attempt should be made to correct this by manipulation before the mouth is closed in occlusion. For this a jackscrew splint may be necessary. At times this over-riding with a permanent ridge must be accepted. In such cases although the teeth may be in a useful occlusion there will be a slight depression with flattening of the face on the affected side. It is usually necessary to keep the teeth wired in occlusion for a period of three or four weeks following which the mouth may be opened and the patient allowed to partake of more solid but still a fairly soft diet. The complete and solid union of fractures of the upper jaw is usually slow in cases where the initial mobility has been great. It is frequently possible to note a definite spring or slight movement of the fractured side for three or four months after the injury. In time, however, union becomes clinically quite firm, and the patient is not conscious of any spring on strong mastication. For many months the teeth on the affected side may feel prominent or numb. There will usually be recovery from this symptom or it may become hardly noticeable.

At times displacements may be very marked, particularly where there is depression of the molar region with open bite anteriorly and replacement by manipulation or wiring is impossible. In such cases an over-head appliance using cranial force may be indicated. An emergency appliance of this type can be made (Figure 15) by using an operating room cap on which may be sewn pads of harness felt in each temporal region. Upon each pad there is sewn a brass temporal head plate in which is incorporated two bolts and a bar which is perforated at each end to slide over the bolts. By means of thumb nuts these bars may be tightened upon an extra oral arm which, in turn, is attached to an upper jaw splint. This splint may be of the regular cast silver type with rectangular tubes (Figure 16a) or of an universal type which permits immediate treatment of the fracture by adapting the splint to the upper teeth by the use of dental impression compound. (Figure 16b). In cases with marked lateral displacement I have on several occasions used a regular extra oral arm on one side and on the other inserted a horizontal

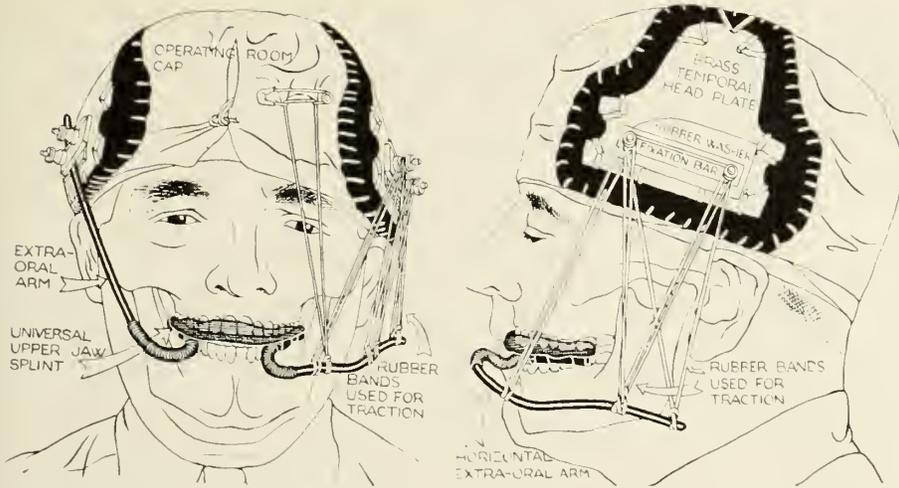


FIGURE 15

Universal head cap and splint appliance for immediate reduction of the fractures of the upper jaw. This fracture appliance is more quickly applied than the orthopedic plaster headcap, which, however, is stronger, more firm—and is indicated for prolonged craniomaxillary fixation. The emergency headcap is more particularly indicated for quick reduction of displacements of the upper jaw preliminary to immobilization by inter-dental wiring.

extra oral arm which is utilized for the attachment of rubber binders running to the temporal head plate bolts (Figure 15). By adjusting these binders and the arm considerable pull can be exerted in an upward and outward direction. Marked resistance to replacement has succumbed to this continual force over a period of 24 hours. At this time the teeth may be wired together by the loop method of indirect dental fixation, or the splint may be used further and a vertical extra oral arm substituted for the horizontal one with the rubber binders. In practice the emergency head cap is reinforced and made to fit more firmly by means of several strips of adhesive tape. In some cases, particularly those in which the horizontal level of the occlusal surfaces of the upper teeth is somewhat difficult to maintain, it may be advisable to construct an orthopedic head cap using stockinet, harness felt, temporal head plates and plaster of paris bandages. It may be necessary to try to maintain a proper horizontal occlusal level by wearing such an appliance for six or eight weeks. I have seen a few cases where apparently on account of severe comminution,

the occlusal plane of the upper teeth has been elevated to a level of nearly one centimeter above the normal.

FRACTURES OF THE MALAR BONE

Fractures of the malar bone are due to direct violence; and usually there is a noticeable flattening of the upper portion of the cheek and palpation will show a depression of the external portion of the lower orbital margin. These fractures may also be associated with severe comminution and displacement of the entire upper jaw, in which case there is a probability of infection of the maxillary sinuses. Uncomplicated fractures of the malar bone can usually be elevated by means of a modified towel clamp forceps (Figure 17). One prong is inserted through the lower eyelid and made to engage the depressed orbital margin, and the other prong is made to pierce through the skin of the cheek well below the lower border of the malar bone. By closing the forceps the instrument engages the malar bone; and by firm manipulation it can usually be brought up to its normal position. Where difficulty is met, it may be necessary to make a cheek incision externally

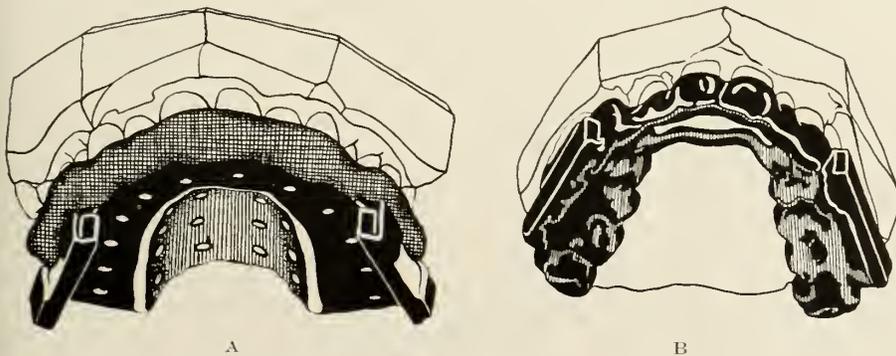


FIGURE 16

(a) Universal upper jaw splint with rectangular tubes for the attachment of extra oral arms to a head cap. The splint is attached to the teeth by means of dental impression compound. (b) Cast silver upper splint with rectangular tubes for the attachment of extra oral arms.

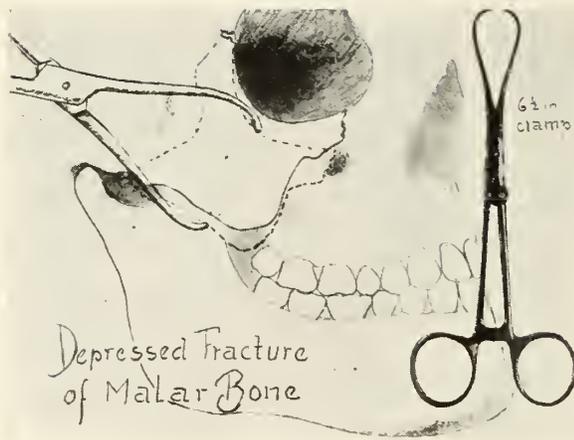


FIGURE 17

The reduction of a depressed fracture of the malar bone by the use of a clamp which grasps the bone through the skin of the eyelid and the cheek.

below the malar bone through which a periosteal elevator is inserted and used to pry up the bone. If replaced early, the fractured surfaces tend to engage each other and hold; and there is very little danger of recurrence of the displacement; if due care is exercised. The patient is instructed to refrain from chewing forcibly and to use a soft diet for two or three weeks. If operation is not undertaken for eight or ten days after the accident, the ends of the fragment will have become somewhat rounded off and there is much more likelihood of recurrence of the deformity. Extreme care then should be taken. Other methods advocated for replacement of the malar bone are: 1, the use of hooks and elevators; 2, the screw porte, applied through external incisions; 3, the use of heavy sounds passed through the maxillary sinus through an opening in the canine fossa; 4, a very interesting method and one particularly recommended for cases of long standing is that demonstrated by Gillies, Kilner, and Stone³. Through an ex-

ternal incision in the temporal region the temporal fascia is incised and a lever is inserted between the fascia and the muscle and passed down until it slips under the depressed bone which is manipulated to a correct position. In old cases with considerable degree of union it may be necessary to refracture before it is possible to elevate the malar bone.

Old fractures that unite thoroughly in a depressed position may at times be improved by refracturing; but I have hesitated to do this. The combination of a depressed fracture of the malar bone and the coronoid process with scar tissue formation has already been noted in the discussion of fractures of the coronoid process. These are often due to penetrating wounds.

FRACTURES OF THE ZYGOMATIC ARCH

Fractures of the zygomatic arch are quite rare and are due to direct violence. Most cases require no treatment but occasionally cases with depression are seen. For such cases the method of Mates⁴ is most efficient. A curved needle is made to pass from above the arch downward behind the depressed fragment to emerge through the skin beneath it. A double silk thread is carried through, which, in turn, serves to pull through a length of silver wire. This wire can then be used for traction to pull the bone up into position. In the event that it does not tend to remain in position, the wires can be twisted over a microscope slide, the ends of which rest on the intact bone. Fractures of the zygomatic arch may also be associated with fractures of the coronoid process of the mandible, and open operation may become necessary.

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NEW SOUTH DAKOTA LEGISLATION

It is commendable and gratifying that the legislature of our neighbor state has granted increased power to the State Board of Control in the supervision and control of the feeble-minded. Their new law reads: "It shall be the duty of all doctors, nurses, hospitals, penal, and charitable institutions county welfare boards, public health officers, and public officers, boards, or commissions within the state of South Dakota, to report to the State Commission for the control of the feeble-minded the name, age, and residence of all children believed by them to be feeble-minded, and also to furnish whenever requested by the State Commission for the control of the feeble-minded any and all information which they may have relative to name, age, residence, and antecedents of any person believed to be feeble-minded." The county board of insanity in each county is then required to "apprehend, examine, commit, establish guardianships, transport, and maintain the custody of any feeble-minded person with their respective counties."

By this new legislation, it is expected that within a generation the name of every feeble-minded person will be included in a census. According to the current set-up in the state of Minnesota, it has been stated by Dr. Kuhlmann, director of the Research Bureau of the State Board of Control, that it will require 635 years to bring the feeble-minded under state control.

Ten years ago, he made a strong appeal for a state census of mental defectives. (*Journal of Delinquency*, 8:247-262, 1932). This article shows the much needed change in apprehending and controlling the feeble-minded.

The price we pay for handling mental defectives in the more or less lax way is appalling. Dr. Kuhlmann estimates that if in addition to direct and indirect costs to relatives, school employers, courts, and charities be included, the total expense to the state of Minnesota reaches the sum of fifty million dollars per annum. But the economic problem is not the only reason why we should improve our methods of supervising and controlling the feeble-minded. As Florence Davis, executive secretary of the Child Welfare Board of Hennepin County aptly stated, the program of the State Board of Control should be based on the policies of "(1st) preventing the propagation of the feeble-minded; (2nd) protecting the feeble-minded from exploitations; (3rd) assisting them to lead healthful, happy, and useful lives; and (4th) to protect the public from the social and economic burden to which the unsupervised feeble-minded so greatly add." Such policies are important for social progress.

Under the new laws of South Dakota, it appears that too much reliance is placed upon the intelligence test. The diagnosis of feeble-mindedness must not only include standard intelligence tests which should be a part and only a trivial

part of the examination, but investigations of the individual's behavior and reactions in his social life must also be undertaken. Physical examination, history of past illnesses, the family history in regard to mental disease and general achievement, as well as home environment must all be taken into account before a diagnosis of feeble-mindedness is made. Psychologists, themselves, appreciate that intelligence tests are far from perfection in determining an individual's capacities and opportunities.

More interest by physicians and more propaganda is needed to improve our present laws and to obtain the confidence of the public.

Nathaniel J. Berkwitz, M.D.

JULY 4th—FIREMAN, SAVE MY CHILD

We like to see a proper observance of the fourth day of July, and believe a celebration is in order even in this A. D. (*Anno Depresso*). But he whose patriotism is limited to one day each year, and spends itself in excessive pyrotechnics should be required to pass an intelligence test immediately preceding the annual debauch.

If he is found to be safe and sane and can be entrusted with high explosives and deadly weapons, then let the eagle scream; but if his I. Q. is low and his judgment deficient, he should be tethered at a safe distance where he can at least not harm others by explosive accidents in his hilarity.

The accomplishment of the sight saving function of silver nitrate in the new-born should be an inspiration to all who would extend this happy faculty among those who already have enjoyed the blessings of undimmed vision and would therefore more keenly feel its loss by a sudden accident. If every physician in the United States would warn all those they come in contact with during these intervening days, there would be many lives and much vision saved. They should be warned against the dangers of tetanus from holding explosives in the hand but particularly against visual examination of duds or any delayed performance whatsoever.

A. E. H.

DEVELOPMENTS IN EXPERIMENTAL AND CLINICAL PHYSIOLOGY

Physiology is generally looked upon as an undergraduate subject whose experiments are rarely reported except in publications devoted exclusively to such studies, and read by teachers and students. It is highly important that the man in practice should follow the changing views and tendencies based upon the findings of both experimental and clinical physiology, and we believe that a few hints at this time may prove

of interest to those who would know what is going on in the laboratory world which, after all, has contributed so much in the past.

A study of the ciliary movements of the mucous membranes has opened a new field. Small particles have been deposited on such membranes and their directions of travel shown by aid of moving pictures. The findings have been very interesting indeed and may become quite practical.

It has been determined that the heart muscle cannot tolerate lactic acid increase to the same extent as the skeletal.

With an increase of fever, it has been shown that there is increase of viscosity which favors elimination by the greater possibility of agglutination; another protective mechanism of the vascular system.

Work is being done upon the relationship of the sympathetic, or so-called automatic nervous system, to blood pressure and glycemia. Rami may be cut to affect the periphery without interfering with the functions necessary to life. We referred to this in a previous editorial on "A Spiritual Renaissance in Medicine" and have been enthused by additional reports of progress since that writing.

A. E. H.

HOW TO CHOOSE A SPECIALIST

Those who have honored us by a perusal of these pages in the past must have surmised ere this that the writer belonged to that ancient, almost free, and, once upon a time accepted order of general practitioners.

Far be it from any member of that modest band to extol the past, acclaim its deeds, or bemoan the fate that seems inevitable with civilization's onward tread to leave them as mere guides to the sachems of a new order. And yet, they would raise their voices against further relegation.

They do not believe, as a general proposition, that the specialist should be directly sought nor that the most heroic treatment should be instituted first. They believe that it would be better for all concerned if the patient would first seek the advice of a general practitioner and be by him referred, should the occasion demand. In New York, physicians may be found who devote most of their time to the directing of patients to suitable specialists and they are deservedly paid a fee of five or ten dollars by each patient for such service. Nothing so important should be left to chance. Economy is rarely found in unguided short cuts. The general practitioner should be the guiding practitioner.

A. E. H.

THE INDICATIONS FOR TONSILLECTOMY DURING CHILDHOOD

(Continued from Page 340)

tonsillitis or other infection is a favorable time to operate. In rheumatic fever it is usually preferable to wait three to four weeks, depending on the condition of the heart.

SUMMARY

In the first six years of life, conservatism is indicated when contemplating removal of tonsils only because of their enlargement. The physician should adhere strictly to the five indications for removal of tonsils. Indications for tonsillectomy that sometimes are accepted as valid are that a child is "below par," is underweight, or lacks appetite. However, if tonsillectomy is performed for such reasons the supposed indication for the operation usually remains after the procedure.

STATE CONTROL OF THE FEEBLE-MINDED IN SOUTH DAKOTA

(Continued from Page 343)

the sterilizations have been for cases that have been committed by court order and for sterilization only. The number of such sterilizations are increasing. The patients are returned to their homes after the operation. Several of these patients have since married.

The law on sterilization requires sterilization of feeble-minded persons if there is danger of procreation and if the offspring are likely to have a tendency to feeble-mindedness. That confines compulsory sterilization to those who are attempting to evade the anti-marriage law, sex offenders and married persons that have a defective hereditary strain.

Marriage is denied all feeble-minded persons who are committed to state control regardless of the cause of the deficiency. Feeble-minded persons can not become desirable parents. Furthermore they are most unlikely to marry normal persons.

The South Dakota laws for the control of the feeble-minded have not been tested in the supreme court of the state. A test case will be welcomed by friends of control. However, the law was written with the aid and advice of good legal talent. It was carefully revised by the attorney general. It requires the alleged feeble-minded to have his "day in court" before he can be committed. He is provided with the right of appeal. There is apparently no conflict with the Federal or State Constitution.

How do the patients and their relatives react to state control? Much tact has been necessary in dealing with parents. However, there has been very little active resistance. Parents of six of the patients have retained lawyers to represent them at the hearings. In almost all cases the cooperation of the parents and relatives has been secured. This has been due largely to the patience and sincerity of members of the Sub-Commissions. Their sympathetic and patient explanations have allayed fears and disarmed many who came before the boards with resentment.

The state is seeking to protect the feeble-minded against abuse and neglect. If a patient has property a legal guardian must be appointed to preserve that property for his own care. If a girl is taken advantage of for immoral purposes better supervision is provided or she may be committed to the institution. If relatives die and the patient is left without care a home must be provided. These provisions appeal to parents, and officials have heard many expressions of gratitude for the good they offer.

BOOK NOTICE

THE PRACTICAL MEDICINE SERIES. GENERAL MEDICINE, edited by George H. Weaver, Lawrason Brown, George R. Minot, William B. Castle, William D. Stroud, Ralph C. Brown. Series 1932. Chicago, The Year Book Publishers, Inc., 1932. Price \$2.25.

The editors of the current year book of General Medicine have done excellent work in reviewing the literature of 1932. They show discrimination in their selection of articles for review and epitomize the contents of these articles in excellent style. The book itself is the same convenient size as heretofore, well printed and low in price.

In the space of a short review it is not possible to mention individual articles at length, for over five hundred important papers are summarized from over one hundred medical publications from seventeen different countries. The publishers are doing a real service to the medical profession in getting together and making available the information here contained. The reviewer thoroughly believes that anyone receives greater value than in the case of any similar publication.

THOMAS A. PEPPARD, M.D.

In 1930 there were sixteen million children under six years of age in the United States. What is society doing for these children in the way of providing play schools and educational facilities?

This question is answered in "Nursery Education,"

the latest report published by the White House Conference on Child Health and Protection, which appears in book form from the press of the Century Company this month. Dr. John E. Anderson, director of the University of Minnesota Institute of Child Welfare, headed the Committee on the Education and Training of the Infant and Pre-school Child, which undertook a survey of all institutions having an education and training program for pre-school children and a survey of the status of the young child in the home.

A total of 1,275 day nurseries, nursery schools and private kindergartens were studied as to housing, equipment, teaching personnel, medical service, health education and play facilities and program. This is essentially a fact-finding study and represents the most comprehensive investigation so far undertaken on this phase of child care.

Complete medical examinations once a year or oftener are given in over half the institutions studied, the report states. They are most frequently provided in day nurseries and least frequently in kindergartens. Throat, teeth, heart, lungs and skin are the items usually included in examinations.

One-half of the play schools reported that 90 to 100 per cent of the children were vaccinated against small-pox, and one-third reported immunization against diphtheria. Medical histories previous to enrollment are kept by slightly over half the institutions and later medical histories by two-thirds. Medical records were sent in by a smaller group of institutions. Behavior and personality ratings were given by very few, and were mostly from nursery schools.

Cod-liver oil is served in about one-half the institutions and orange and tomato juice is served once a day or oftener. Diets prepared by an outside organization are used by one-third of the relief schools.

Daily medical inspections are given in one-half the schools, most often in the nursery schools, and in half the schools nurses make these inspections, teachers in one-third, and the remainder are given by physicians. Nursery schools have the most outdoor play space for each child and relief institutions the least. Nursery schools also have the most indoor play space and kindergartens the least.

Reasons for health practices, such as brushing the teeth, drinking milk and washing the hands are given to children in two-thirds of the institutions and health instruction is given by means of stories, rhymes, songs or direct explanations.

The nursery school movement is not a fad, the Committee declares, but an attempt to meet conditions of modern life, such as the employment of mothers, apartment house living, small families and the relative isolation of the individual modern child.

Minimum standards which should be required of all institutions receiving young children for care and training are suggested by the data.

S. GOTTWERTH.

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.

Physicians will please note the correct telephone number of Berg's Rest Hospital is Gladstone 2171.

Dr. M. Robert Gelber, Britton, S. D., has moved to Aberdeen, where he has opened offices for general practice.

Dr. H. M. Finch, Austin, Minn., has moved to Detroit Lakes, where has become an associate of Dr. O. O. Larson.

Dr. J. H. Fjelde, Fargo, has retired from the Dakota Clinic of that city, and opened private offices for general practice.

Dr. C. F. Wohlrahe, Springfield, Minn., has sold his practice in that city, and is now planning on locating in Minneapolis.

Dr. H. M. Champney, one of the pioneer physicians of Belle Fourche, S. D., passed away on June 18th, at the advanced age of 75 years.

Dr. Francis Lehman, who had been in practice at Minneapolis for over 25 years died at Middletown, Pa., last month at the age of 70 years.

Dr. J. B. James, Page, N. D., was recently married to Miss Gena Johnson of Fargo. They are making a lengthy wedding trip to eastern cities.

Dr. T. D. Jones, who has been in practice the last year at Aberdeen, has moved to Bowdle, N. D., where he has opened offices for general practice.

The District Medical Society held their last summer meeting on June 13th, at Sioux Falls, with Dr. R. E. Crowder, Sioux City, Iowa, as guest speaker.

Dr. W. H. Gilsdorf, New England, was recently married to Miss Esther Anderson of Dickinson, N. D. Dr. Gilsdorf is a Minnesota University graduate.

Dr. W. H. Brissenden, widely known physician of Roundup, Mont., where he had been in active practice for over 25 years, died on June 7th, after an illness of only three days.

Mrs. James Blake, Hopkins, Minn., was elected president of the Womans Auxillary of the American Medical Association at the annual meeting held at Milwaukee last month.

Dr. Edward H. Whitcomb, a veteran St. Paul physician and politician died last month, after a long illness. Dr. Whitcomb had been active in medical and civic societies for many years.

Dr. D. M. Siperstein, Minneapolis, sailed from New York, June 21, to attend the Third International Pediatric Congress which will be held in London on the 20th, 21st and 22nd of July.

The Northern Minnesota Medical Association will hold its annual meeting at Willmar, Minn., on September 8, 9, and 10. A complete program will be published in a later issue of the LANCET.

Drs. J. A. Meyers, C. A. Stewart and F. E. Harrington, Minneapolis, were on the program as speakers at the annual meeting of the American Child Health Association held at Ann Arbor, Mich., last month.

Offices of more than 500 Minneapolis doctors are functioning as health centers for inoculation of men, women and children as the Minneapolis campaign to make the city safe from smallpox and diphtheria opened.

Dr. Helena K. Wink, physician at Jamestown S. D. for 50 years, is at Ann Arbor, Mich., attending the 50th reunion of her class at the University of Michigan. Dr. Wink recently celebrated her 79th birthday.

A picnic of the members and their families of the Ommsted-Houston-Fillmore-Dodge County Medical Societies was held last month at Ferndale, Minn. Dr. W. J. Mayo and others were among the guest speakers.

Many improvements, as well as a new wing is being made on the St. Joseph hospital at Lewiston, Mont. It will give them some thirty new rooms, with modern conveniences and thoroughly up-to-date accommodations.

The Budd hospital, Roseau, Minn., is undergoing extensive remodeling and with additional front porches added. The new plans will modernize the hospital to include two waiting rooms, a spacious entrance, enclosed view porches, and new sanitary floors.

The Carver-Scott Medical Society held their June meeting at Chaska, Minn., with a large attendance of members and elected the following officers, Dr. E. J. Eklund, Norwood, president; Dr. Snyder, Jordan, vice-president and Dr. Ormond, Waconia, secretary.

The Great Northern Railway Surgeons Association will hold their 1934 meeting at Glacier

Park, Mont. New officers elected are Dr. W. Q. Conway, Kalispel, Mont, president; Drs. D. Cocsen, Fernie, B. C., G. R. Christie, Long Prairie, Minn., and L. S. Trask, Ewart, Wash., vice-presidents, and Dr. R. C. Webb, Minneapolis, secretary-treasurer.

The Minneapolis Community Fund have opened camps to accommodate 9,000 individuals, mostly from the homes of unemployed needy families. Health-building and general rehabilitation of rundown mothers and undernourished children, as well as homeless boys and girls, who have suffered from the depression, will be the major part of the camp 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) William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. July 5, "Obesity and Heart Disease"; July 12, "Chinese Medicine"; July 19, "Insulin and Underweight"; July 26, "Tumors of the Bladder."

"Dr." Ray D. Smith, who claimed that he came to St. Paul from Clinton, Ill., made a hasty departure from the state on June 12, rather than stand trial in the District Court on a charge of practicing healing without a Basic Science Certificate. Smith had been maintaining a vending stand and would give a lecture about the human body using a wax model showing the internal organs. During his talk he explained that he had practiced medicine for twelve years and had spent two years at the Mayo Clinic, Rochester. Following an investigation made by the State Board of Medical Examiners, he was taken to police headquarters where he retracted his statement about being a doctor and also denied having been at the Mayo Clinic. He was peddling a so-called Liberty Tonic which purportedly is manufactured in Memphis. "Dr." Smith is driving a 1928 Nash coupe automobile with Illinois license plates for 1933 numbered 1082733. The serial number of the car is 440458; the motor number is 323683. Smith stated at police headquarters that he was only in Minnesota temporarily and was on his way to North Dakota and Montana. Smith is accompanied by a lady about twenty-five years of age whom he states is his wife. If these people are seen anywhere in the state of Minnesota, kindly notify the Minnesota State Board of Medical Examiners, 524 Lowry Medical Arts Bldg., St. Paul, and a warrant will be issued for Smith's arrest.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD
OF MEDICAL EXAMINERS, MAY 22, 1933

(April)

BY EXAMINATION

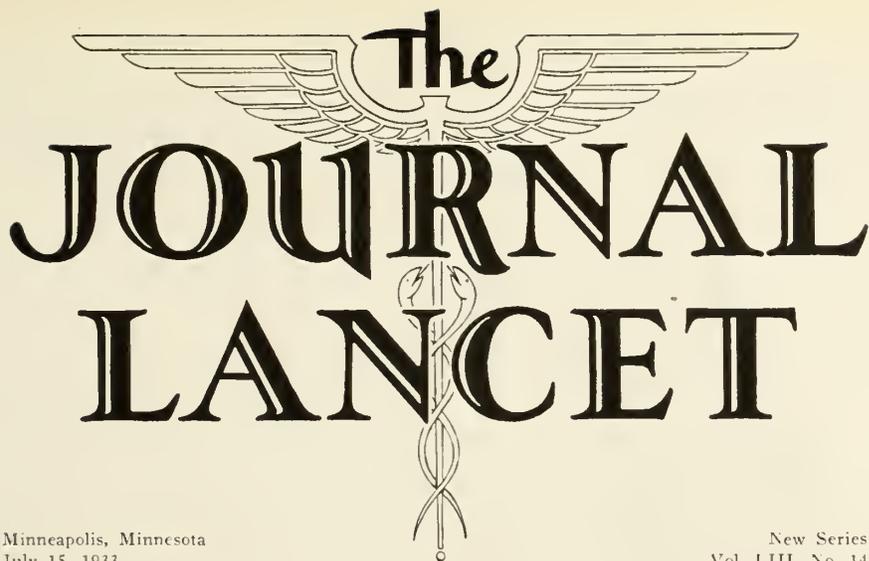
Name	School of Graduation	Address
Addy, Edward Rezin	U. of Minn., M.B., 1931	517 E. 2nd St., Duluth, Minn.
Anderson, Nels Henry	U. of Minn., M.B., 1932, M.D., 1933	Bethesda Hospital, St. Paul, Minn.
Appell, Adolph Asher	U. of Toronto, M.D., 1929	Mayo Clinic, Rochester, Minn.
Burch, Hobart Alexander	Harvard Univ., M.D., 1929	504 4th St. S. W., Rochester, Minn.
Cain, Clark Leon	U. of Minn., M.B., 1932	Ancker Hospital, St. Paul, Minn.
Coate, Joseph Dalton	Indiana U., M.D., 1930	Mayo Clinic, Rochester, Minn.
Cragg, Richard Williams	U. of Cincinnati, M.B., 1930, M.D., 1931	Mayo Clinic, Rochester, Minn.
Davis, David Bennett	U. of Minn., M.B., 1933	Ancker Hospital, St. Paul, Minn.
Davis, Perk Lee	Temple Univ., M.D., 1928	Mayo Clinic, Rochester, Minn.
Deacon, Alfred Ernest	U. of Manitoba, M.D., 1929	Mayo Clinic, Rochester, Minn.
Greenfield, William Theo.	U. of Minn., M.B., 1932	Fairview Hospital, Minneapolis, Minn.
Hankerson, Robert Geo.	U. of Nebr., M.D., 1932	Hill City, Minn.
Heilman, Fordyce Russell	Northwestern U., M.B., 1930, M.D., 1931	Mayo Clinic, Rochester, Minn.
Holmen, Robert Winston	U. of Minn., M.B., 1932, M.D., 1933	University Hospital, Minneapolis, Minn.
Hynes, John Eldon, Jr.	U. of Minn., M.B., 1931, M.D., 1932	500 Delaware St. S. E., Minneapolis, Minn.
Johnson, Karl Frederick	U. of Minn., M.B., 1931, M.D., 1932	Osceola, Wis.
Loomis, George Lyman	U. of Minn., M.B., 1932	Miller Hospital, St. Paul, Minn.
Mack, Joseph John	U. of Minn., M.B., 1932	Ancker Hospital, St. Paul, Minn.
MacKinnon, Donald Charles	U. of Minn., M.B. and M.D., 1932	Minneapolis General Hospital, Minne- apolis, Minn.
McKenzie, Charles Hugh	U. of Alberta, M.D., 1927	916 E. 15th St., Minneapolis, Minn.
Olson, Grant Edmund	U. of Minn., M.B., 1932	Ancker Hospital, St. Paul, Minn.
Parker, David Marcellus	U. of Minn., M.B., 1932	St. Mary's Hospital, Minneapolis, Minn.
Peterson, John Hartley	U. of Minn., M.B., 1932	Miller Hospital, St. Paul, Minn.
Petri, Karin Aileen	U. of Minn., M.B., 1932	University Hospital, Minneapolis, Minn.
Porter, George LeRoy	U. of Nebr., M.D., 1931	Mayo Clinic, Rochester, Minn.
Prins, Leo R.	U. of Minn., M.B., 1932	Selby and Victoria Aves., St. Paul, Minn.
Sather, Russell Olav	U. of Minn., M.B., 1932	Minneapolis General Hospital, Minne- apolis, Minn.
Siegmann, William Chauncey	U. of Minn., M.B., 1932	2651 13th Ave. S., Minneapolis, Minn.
Slavens, John Jacob	U. of Toronto, M.D., 1930	Dept. of Path., U. of Minn., Minne- apolis, Minn.
Sorensen, Elmer Mork	U. of Minn., M.B., 1932	Ancker Hospital, St. Paul, Minn.
Watson, Sidney William	U. of Minn., M.B., 1932	Gillette Hospital, St. Paul, Minn.
Windsor, Robert Lloyd	Columbia U., M.D., 1932	Ancker Hospital, St. Paul, Minn.

BY RECIPROCITY

Ochsner, Clarence George Washington U., M.D., 1931 411 Garfield Ave., Chicago, Ill.

NATIONAL BOARD CREDENTIALS

Cole, John Gordon U. of Minn., M.B., 1931, M.D., 1932 Redwood Falls, Minn.
 Priest, Robert Edward U. of Minn., M.B., 1931, M.D., 1932 1226 E. 4th St., Duluth, Minn.
 Waugh, John McMaster Rush Med. Col., M.D., 1932 Mayo Clinic, Rochester, Minn.



The JOURNAL LANCET

Minneapolis, Minnesota
July 15, 1933

New Series
Vol. LIII, No. 14

TRANSACTIONS OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION FIFTY-SECOND ANNUAL SESSION—1933

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53rd Annual Session—Mitchell, 1934

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PUBLICATIONS SECTIONS 4 AND 6

THE COUNCIL

MEDICAL EDUCATION AND HOSPITALS SECTION 6

J. C. OHLMACHER, M.D., 1935..... Vermillion

N. T. OWEN, M.D., 1934..... Rapid City

W. A. DELANEY, M.D., 1936..... Huron

MEDICAL DEFENSE

S. M. HOHF, M.D., 1934..... Yankton

J. D. WHITESIDE, M.D., 1935..... Aberdeen

E. B. TAYLOR, M.D., 1936..... Huron

MEDICAL ECONOMICS

D. S. BAUGHMAN, M.D., 1935.....Madison
 J. M. WALSH, M.D., 1934.....Rapid City
 W. F. BUSHNELL, M.D., 1936.....Elk Point

HYGIENE

I. M. FRESHOUR, M.D., 1936.....Yankton
 GOLDIE ZIMMERMAN, M.D., 1935.....Sioux Falls
 M. J. HAMMOND, M.D., 1934.....Watertown

CANCER

W. R. BALL, M.D., Chairman, 1936.....Mitchell
 J. D. WHITESIDE, M.D., 1934.....Aberdeen
 N. J. NESSA, M.D., 1935.....Sioux Falls

NECROLOGY

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FIRST MEETING*of the***HOUSE OF DELEGATES**

Monday, May 15, 1933.

Marvin Hughitt Hotel, Huron, S. Dak.

Meeting was called to order by President Dr. J. R. Westaby.

Twenty-one members present. Those answering roll call were: Drs. J. R. Westaby, president; E. W. Jones, president-elect; W. G. Magee, vice-president; J. F. D. Cook, secretary-treasurer; E. A. Pittenger, M. J. Hammond, C. E. Sherwood, B. M. Hart, E. B. Taylor, A. S. Rider, S. M. Hohf, J. L. Stewart, H. R. Kenaston, A. E. Bostrom, W. A. Bates, B. C. Murdy, J. D.

Alway, J. B. Vaughn, H. B. Martin, H. D. Sewell, W. R. Ball, Goldie E. Zimmerman, J. C. Ohlmacher, I. M. Freshour, P. D. Peabody. Quorum present.

The following reference Committees were appointed by the President:

Committee on Resolutions and Memorials: Drs. J. B. Vaughn, chairman; S. M. Hohf, H. R. Kenaston.

Committee on Nominations and Place of Meeting: Drs. P. D. Peabody, chairman; A. E. Bostrom, H. R. Kenaston, J. L. Stewart, J. C. Ohlmacher, B. A. Bobb, H. D. Sewell, B. M. Hart, J. B. Vaughn, E. A. Pittenger, D. S. Baughman and G. E. Zimmerman.

Reports of Officers and Audits: Drs. W. G. Magee, J. C. Ohlmacher, M. J. Hammond.

Amendments to the Constitution and By-Laws: Drs. W. A. Bates, E. W. Jones, J. F. D. Cook.

Reading of the minutes of the 1932 Session. Moved, seconded and carried that the minutes of the 1932 Session as printed in the JOURNAL-LANCET be accepted. Carried.

Secretary-Treasurer's report. The same was referred to the Committee on Reports of Officers and Audits.

SECRETARY'S REPORT

I beg to submit the following report. Correspondence of the office during the last year has been voluminous due in part to the activity of the Association in its efforts to procure a Basic Science Law for South Dakota. The visitation of the various District Medical Societies was a pleasant duty. I accompanied President Dr. J. R. Westaby on several trips. The districts are presenting commendable programs. The secretaries of the district societies have co-operated with this office. In some instances they have been remiss in sending news items of general interest to the profession of the state and their program.

A copy of the resolutions was adopted relative to hospitalization of veterans. Copies of this resolution were forwarded as directed and favorable replies received from all. Resolution looking toward the changes of the fiscal year should be considered by the House of Delegates at this meeting and referred to the Council. The resolution relative to the reduction of the dues should receive your consideration and referred to the Committee on Amendment to By-Laws.

Resolution considering the furnishing of a subscription to the JOURNAL-LANCET to all hon-

orary members should receive your consideration and referred to the Council.

Special meetings of the Council were held as follows:

October the 13th at Huron. Spent the afternoon in considering changes in the drafting of the Basic Science Bill. The minutes of that meeting are as follows:

Roll call of Council: Drs. J. R. Westaby, E. W. Jones, B. A. Bobb, E. A. Pittenger, M. J. Hammond, C. E. Sherwood, A. E. Bostrom, E. B. Taylor, H. R. Kenaston, B. M. Hart, S. M. Hohf, A. S. Rider, W. A. Bates and J. F. D. Cook.

Dr. H. R. Kenaston was elected Chairman of the Council.

Dr. B. A. Bobb of Mitchell was elected to fill the vacancy of Councilor for Mitchell District.

Basic Science Bill was presented. Discussion of the measures followed. On motion of Dr. S. M. Hohf, supported by Dr. A. E. Bostrom, that Dr. W. C. Woodward, of the A. M. A., be asked to prepare a section to be added to present bill requiring annual registration. Annual registration fee to be \$1.00 per annum, per calendar year. Carried.

Dr. W. A. Bates moved, supported by Dr. E. B. Taylor that Section 6 be revised as follows: "supplemented by oral and practical examination at discretion of board." Carried.

Section 4. Dr. E. A. Pittenger moved that the per diem be \$5.00 per day, supported by Dr. S. M. Hohf. Carried.

Section 5. Moved by Dr. A. S. Rider that the examination fee be \$15.00, re-examination fee be \$5.00 and reciprocity be \$25.00, supported by Dr. E. A. Pittenger. Carried.

Motion by Dr. A. S. Rider that Drs. J. R. Westaby, president, and J. F. D. Cook, secretary, be a Legislative Committee to contact Hon. J. H. McFarland, of Watertown, S. Dak., during the 1933 Session of the Legislature. Dr. W. A. Bates supported the motion with the addition of Dr. A. E. Bostrom to the Committee. Carried.

Dr. W. A. Bates spoke of the employment of County physicians by the Board of County Commissioners. The activity of the physician being limited by the authority of the County Commissioners. The proposal was discussed by the Council, and Dr. Bates was requested to prepare a formal plan, and present same to the secretary. The secretary was directed to communicate the same to the A. M. A., for their reaction. Secretary, Dr. Cook suggested that

this subject would be good topic for consideration by the Secretaries' Conference which will be held in Chicago, November 18-19, 1932.

Inquiry was made regarding corporate medical practice by lay organizations. First National Bank of Aberdeen, and Chamberlain Sanatorium were cited.

Discussion of a bill for liens for hospital and physicians service in auto accidents where the parties were insured by liability companies. It is understood that the South Dakota Hospital Association are preparing and intend to present such a bill to the 1933 Legislature. The State Medical Association offer their co-operation and support of such a measure.

Motion to adjourn. Carried. 5:00 P. M. October 13, 1932.

J. F. D. COOK, M.D.

Secretary-Treasurer.

MINUTES OF COUNCIL MEETING AT WATERTOWN, S. DAK.

December 6, 1932

Roll call of Council: Drs. J. R. Westaby, W. G. Magee, E. B. Taylor, B. M. Hart, M. J. Hammond, A. E. Bostrom, A. S. Rider, C. E. Sherwood, B. A. Bobb and J. F. D. Cook, secretary.

Phone message from Dr. Chas. Fleet. Telegrams from Drs. H. R. Kenaston and E. W. Jones.

Motion by Dr. E. B. Taylor, supported by Dr. W. G. Magee, that Dr. J. R. Westaby act as chairman. Carried.

Motion by Dr. E. B. Taylor, supported by Dr. B. M. Hart, to continue Committee, Drs. J. R. Westaby, A. E. Bostrom and J. F. D. Cook, to contact Dr. W. A. Bates and arrange for a conference with Governor-Elect Hon. Thomas Berry, relative to the proposed legislation; to contact H. D. W. Conway, Attorney General-Elect of Sioux Falls and Legislative Council for the 1933 Legislative Session.

Motion by Dr. W. G. Magee, supported by Dr. E. B. Taylor, that fifteen hundred dollars (\$1,500.00) be the budget for this legislation.

Write McFarland that the Council are considering other contract for legislative session. Bicknell was to be contacted by committee.

Secretary presented the Liquor bill emanating from headquarters A. M. A. who were asking for our support through Hon. Christopherson of this bill in the national Congress.

List of Districts and their boundaries, or countries.

List of Legislators for the Council and officers. Mimeographed and supplied from secretary's office as directed.

Suggestion for state program, H. J. Boyts, Sioux City, Iowa, National speaker on T. B. in bovine. Exhibits for same.

Motion to adjourn. Carried.

J. F. D. COOK, M.D.
Secretary-Treasurer.

December 9th. Council Committee to Contact Legislative Council consisting of Drs. J. R. Westaby, W. A. Bates, A. E. Bostrom and J. F. D. Cook. The Committee met December 9th at Aberdeen to consider Legislative Council. The Committee made contact later with Hon. L. W. Bicknell for Legislative Council.

COUNCIL MEETING AT HURON, S. DAK.

Dec. 22, 1932.

December the 22nd, the Council met at Huron for a conference with the Hon. L. W. Bicknell, Legislative Council, to consider activities during the coming Legislative Session.

COUNCIL MEETING AT PIERRE, S. DAK.

Jan. 18, 1933.

January the 18th, 1933, a conference met at Pierre at the request of Hon. L. W. Bicknell for a conference the evening of the 18th and to attend the hearing on the Basic Science Bill before the Joint Committee of the Senate and the House.

COUNCIL MEETING AT PIERRE, S. DAK.

Feb. 3, 1933.

February the 3rd, the Council met at Pierre with the Hon. L. W. Bicknell at his request to iron out problems of Legislation, relative to the Basic Science Bill.

February the 16th, the FORTY-FIFTH DAY. The *House Journal*, page 599 indicates that Dr. Bettleheim, chairman of the committee on Medicine and Surgery, reported the Bill Do Pass as amended. That the Journal of the House for the FORTY-SIXTH DAY page 640 Mr. Kleinsasser moved that further action on House Bill No. 2, be indefinitely postponed, which motion prevailed. Bill defeated.

MEDICAL LEGISLATORS NEEDED

An editorial in the Bulletin of the Wayne County Medical Society.

"The medical profession is slowly but surely becoming convinced that the quickest and surest way to protect the public health and safeguard the principles and standards of medical practice is for doctors to enter the political arena and become active participants in the business of lawmaking.

Years of aloofness and dependence on the conscientiousness and public-spiritedness of professional lawmakers have placed doctors repeatedly in the embarrassing position of gravelling for favor. Instances are too numerous to mention where the long and arduous effort to place medical practice on a high level was totally ignored, and the very foundations of scientific medicine threatened with extinction by some expedient piece of legislation. Yet the doctor has continually refrained from dipping into politics.

While his excuse has always been that he was not cut out for the work and that he has little time to devote to it, he has persistently overlooked the fact that his obligation to the community demands that he contribute to lawmaking fully as much as the lawyer, farmer, butcher, baker and candle-stick maker. In the interests of the public health he is obliged to render service not only as a spectator or advisor but as an active participant whose opinions and expert knowledge should carry at least as much weight as those of others.

Those who have had any experience with legislative bodies know that a vast difference in recognition exists between the opinions of outsiders and those of the legislators themselves. Dr. Tom Jones from Three Corners, acting in an advisory capacity and urging the adoption or rejection of certain legislation, is looked upon as an interloper, a selfish lobbyist or a simple innocuous altruist. The same doctor as a legislator not only has a voice in the proceedings—both public and secret, but he is in a position to give his fellow legislators accurate information and guide them towards the enactment of sensible, constructive legislation.

Some one of these days doctors are going to wake up and find that their luck has failed to hold up and that their rational pleadings—from the outside—have not succeeded in arresting the passage of some particularly vicious, destructive

law. Then we'll see a great deal of belated action and far more effort will have to be expended to undo the damage that could have been obviated by adequate representation.

The only logical way to attain equitable and sane legislation for the medical profession is for doctors, along with the other citizens in their communities, to stand prepared to take active part as members of legislative bodies. The public's present disregard for the pleadings of the 'ins' to be retained in office, and its high regard for the medical profession in general and individual doctors in particular constitutes a setting that is as nearly ideal as can be desired. The opportunity is ripe for doctors to take a hand at the wheel and do a little of the steering themselves."

Annual Conference of State Secretaries at the headquarters of the American Medical Association, Chicago, November 18-19, 1932. Study Dr. Cary's report at that conference as published in the Bulletin of A. M. A.

Regional Conference—Regional Conference of the Sate Medical Association Officers was held in St. Paul, February, the 18th and 19th. The Conference was represented by Indiana, Illinois, Wisconsin, Iowa, Nebraska, Montana, Wyoming, Minnesota, North and South Dakota. Dr. Westaby and your secretary attended this Conference. Dr. Westaby will give you his reaction to this type of meeting. The depression has decimated our membership this year. Membership this year was 165. Last year at the annual meeting we registered 216 paid members with 39 paid up during the balance of the year making a total membership of 255 members in 1932.

Dr. J. R. Westaby and your secretary contacted the Huron District Medical Society, who were the hosts at that meeting. The printed program is evidence of their co-operation in making this meeting outstanding. Since mailing the program I have received several compliments on it from men of the state as well as from Iowa men.

I wish to thank the officers for their co-operation in all matters brought to their attention and their helpful advice in the conduct of this office.

Dated at
Langford, South Dakota
May 15, 1933.

Respectfully submitted,
J. F. D. COOK, M.D.
Secretary-Treasurer.

TREASURER'S REPORT

CASH RECEIVED

1932			
June	17	Balance on hand	\$2,373.50
	28	Dues Sioux Falls District	30.00
	28	Dues Kingsbury District	10.00
	29	Dues Huron District	160.00
July	12	Dues Aberdeen District	30.00
	22	Dues Aberdeen District	20.00
	29	Dues Sioux Falls District	20.00
Aug.	4	Dues Mitchell District	10.00
	11	Dues Yankton District	10.00
	20	Dues Aberdeen District	10.00
Sept.	22	Dues Black Hills District	30.00
	22	Dues Madison District	10.00
	22	Dues Aberdeen District	10.00
	22	Dues Huron District	10.00
	22	Dues Mitchell District	10.00
Oct.	19	Income from exhibits—Watertown session	11.20
	19	Dues Aberdeen District	20.00
Dec.	31	C. D. No. 11232	\$49.06
	31	Interest on above	1.96
	31	Interest on C. D. No. 11233	3.92
	31	Interest on C. D. No. 11528	3.63
		Total	\$58.55
		Ded. Fed. Tax .....	.02
			58.53

1933			
Jan.	20	Dues Huron District	10.00
Apr.	5	Dues Yankton District	210.00
	10	Dues Black Hills District	150.00
	12	Dues Yankton District	10.00
	14	Dues Watertown District	150.00
	15	Dues Madison District	70.00
	15	Dues Black Hills District	10.00
	17	Dues Rosebud District	60.00
	18	Dues Rosebud District	10.00
	20	Dues Watertown District	10.00
	20	Dues Black Hills District	10.00
	23	Dues Yankton District	10.00
May	1	Sioux Falls District (dues)	280.00
	1	Dues Huron District	100.00
	1	Dues Aberdeen District	180.00
	9	Dues Mitchell District	170.00
	9	Dues Watertown District	10.00
	9	Dues Sioux Falls District	20.00
	10	Dues Whetstone Valley District	120.00
	11	Dues Black Hills District	10.00
	12	Dues Pierre District	50.00
		Total deposits	\$2,109.75
		Grand total	\$4,483.25

CASH PAID OUT

1932			
June	18	St. Louis Button Co.	\$ 25.53
	22	Watertown District Banquet tickets (guests)	6.00
	22	Lincoln Hotel, rooms for guests	56.88
	25	J. F. D. Cook, salary	50.00
	25	Searles Bros., printing programs	57.48
	27	Journal-Lancet, subscriptions	313.00
	27	Watertown Public Opinion .....	.78
	28	Flax Mfg. Co., carbon paper	3.50
	28	J. E. Gonce, R. R. fare	55.00
	29	L. S. McGoogan, R. R. fare	25.00
July	1	J. F. D. Cook, salary	50.00
	1	L. Miles, P. M., stamps	2.00
	8	W. W. Duke, expense of transporta- tion	49.68
	9	L. Miles, printing	29.75

	13	L. Miles, printing blanks, etc.	9.29
	14	J. F. D. Cook, salary	50.00
	19	A. E. Bushnell Co., file pockets	8.75
	19	L. Miles, printing 2,000 letterheads...	15.00
	27	L. Curfman, telegram	1.12
	29	L. Curfman, telegrams	6.00
	30	J. F. D. Cook, salary	50.00
Aug.	17	Farrar's Drug Store, mimeograph paper	6.00
	19	L. Miles, P. M., 700 stamped envelopes	21.52
	23	Farrar's Drug Store, mimeo stencils and ink	5.30
	24	L. Miles, P. M.	39.75
	25	Master Reporting Co.	378.89
Oct.	1	J. F. D. Cook, salary	150.00
	3	Expenses Westaby & Cook (Mitchell, Winner and Pierre).....	25.00
	6	St. Charles Hotel, Pierre	5.00
	6	Marvin Hughitt Hotel, Huron (council)	10.00
	8	J. F. D. Cook, salary	50.00
	8	L. Miles, P. M., stamps	5.00
	10	Expenses Westaby & Cook (Huron, Sioux Falls and Huron).....	25.00
	12	Expenses Westaby & Cook (Huron, Sioux Falls and Huron).....	10.00
	13	Marvin Hughitt Hotel, Huron	15.00
	15	F. R. Harding, Treasurer's bond	5.00
Nov.	13	J. F. D. Cook, salary	50.00
	30	A. M. A. Legal Decisions	5.00
Dec.	2	Langford Telephone Co., telephone messages	5.45
	6	Grand Hotel, Watertown	7.60
	8	Expenses J. F. D. Cook (Webster, Watertown and Huron).....	25.00
	16	L. Miles, paper	4.44
	16	L. Miles, P. M., postage	1.00
	22	Marvin Hughitt Hotel, Huron (council)	12.15
	23	L. Miles, P. M., stamped envelopes and printing	31.29
	16	Journal-Lancet, subscriptions	255.00
	29	L. Miles, P. M., stamps	3.63
	31	J. F. D. Cook, salary	50.00
1933			
Jan.	2	L. W. Bicknell, salary	500.00
	4	Langford Telephone Co., telephone messages	7.05
	9	A. M. A. Directory supplement	5.00
	18	Expenses J. F. D. Cook, council at Pierre	50.00
	19	St. Charles Hotel, Pierre	17.00
	23	E. R. Searles Co., mimeo ink and supplies	5.00
	23	L. Miles, P. M., stamps	3.00
	31	L. F. Curfman, telegraph messages...	24.97
Feb.	1	Langford Telephone Co., telephone messages	4.45
	2	L. Miles, printing letter heads	6.00
	6	J. F. D. Cook, salary	50.00
	24	L. F. Curfman, telegraph messages...	5.85
Mar.	3	Langford Telephone Co., telephone messages	21.25
	10	J. R. Westaby, messages	6.15
	20	L. Miles, P. M., stamped envelopes....	26.66
	31	L. Curfman, telegraph message	1.70
Apr.	11	J. F. D. Cook, salary	30.00
	27	J. F. D. Cook, salary	20.00
May	1	St. Louis Button Co., badges 1933 session	15.00
	1	Argus-Leader	5.00
	9	L. Miles, printing 1933 programs.....	55.05
	10	J. R. Westaby, messages	7.25
	10	Fararr's Drug Store, mimeograph supplies	13.25

	12	L. Curfman, telegrams	3.37
		Bank charges: tax, float and exchange since 6-17-32	3.16
		Total	\$2,950.92
		Balance on hand June 17, 1932.....	\$2,373.50
		Cash received since June 17, 1932.....	2,109.75
		Grand total	\$4,483.25
		Total expenditures since June 17, 1932.....	\$2,950.92
		Balance in Aberdeen National Bank & Trust Co., May 13, 1933	\$1,532.33
		Other resources:	
		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
		Rapid City, S. D., Bond.....	500.00
		Total resources	\$2,957.05

Secretary read letters from Dr. James F. Treon of Aurora, Indiana, stating that his father Dr. Frederick Treon formerly of Chamberlain, S. Dak., was with him at Aurora, Ind., and that his health was failing.

The Committee on Scientific Program present the printed program for this meeting as their report.

The House of Delegates are asked to consider the type of program for our annual meeting.

After discussion it was moved by Dr. P. D. Peabody, and seconded by Dr. J. D. Alway that the program for the next meeting be left to the local committee where the meeting is to be held with the co-operation of the officers of the State Association. The program to be as they think best for the interest of the association. Motion carried.

REPORT OF COMMITTEE ON HYGIENE

Dr. E. A. Pittenger, chairman, recommends a continuation of the children's work as being carried on by the South Dakota State Board of Health, complimenting the very excellent way in which the typhoid epidemic at Chamberlain was handled.

Committee on Necrology: The chairman, Dr. J. B. Vaughn, makes the following report and recommends its adoption:

REPORT OF COMMITTEE ON NECROLOGY

Honored President and Delegates of the South Dakota State Medical Association:

Your Committee on Necrology respectfully submits the following for your consideration. With deep sorrow we record the names of thir-

teen of our co-workers of this state who have answered the final summons since our last annual session.

DR. ALFRED JOHN HENNINGS, Kadoka; Sioux City, Iowa College of Medicine, 1898; age 55; died July 18, 1932, in St. Mary's Hospital, Rochester, Minnesota.

DR. ROLLIN EMBURY WOODWORTH, Sanator; Medical Department of the University of the City of New York, 1889; age 66; Director and Superintendent of the South Dakota State Tuberculosis Sanatorium, where he died October 10, 1932.

DR. ARTHUR J. LARSON, Mobridge, graduate of Northwestern University Medical School, Chicago, 1927; age 37; died September 2nd, in Madison, Minnesota, of heart disease. Member of South Dakota State Medical Association.

DR. ROBERT FRANKLIN CAMPBELL, Watertown, Bellevue, N. Y., 1882; age 75; died suddenly of heart disease October 28, 1932. Member of the South Dakota State Medical Association.

DR. FRANK MILLER, Aberdeen; Sterling Medical College, Columbus, Ohio, 1893; age 65; died November 1, 1932, of cerebral hemorrhage. Member of South Dakota State Medical Association.

DR. ANDREW VINCENT ROCK, Mobridge; John A. Creighton Medical College, Omaha, 1906; age 54; died suddenly, December 16, 1932, of heart disease.

DR. GEORGE H. FULFORD, Sioux Falls; Boston University School of Medicine, 1880; age 79; died November 27, 1932. Honorary member of South Dakota State Medical Association.

DR. FREDERICK ARNOLD BRANDT, Sturgis; Washington University, St. Louis, Mo., 1904; age 51; died January, 1933.

DR. HIRAM CRAIG SHOUSE, Plankinton; Hanne-mann Medical College and Hospital, Chicago, 1872; Civil War Veteran; age 88; died January 16, 1933, of uremia.

DR. HARRY W. SUBERBA, Sioux Falls; College of P. & S., Keokuk, Iowa, 1884. Honorary member of the South Dakota State Medical Association. Age 85; died January 28, 1933, of influenza.

DR. HERBERT C. E. MEYER, Sioux Falls; University of Minnesota, 1925; member of South Dakota State Medical Association; age 35; died April 15, 1933, at Mayo Clinic.

DR. FRANK CONGER SMITH, Yankton; New York University and Medical College, 1894; trustee

of Yankton College; age 64; killed by a bull, May 4, 1933.

DR. JOHN F. BARTHELMS, Howard; State University of Iowa, 1891; member of South Dakota State Medical Association; died May, 1933, of a heart attack.

Four of the above named physicians, Drs. Campbell, Fulford, Suberba and Shouse, were in active practice for almost fifty years. Three, Drs. Woodworth, Frank Miller and Barthels, almost forty years.

These men were active in the affairs of their community, town, city and state. They were endowed with the spirit which meant success and which endeared them to the members of the medical profession and to the community.

Faternally Submitted,

(Signed) J. B. VAUGHN, M.D.

Advisory Committee co-operating with the South Dakota Public Health Association, by Dr. A. E. Bostrom. Verbal report.

Secretary Cook proposed the following amendments to the By-Laws:

In comparing Section 4, Chapter III with Section 1, Chapter IV, I find they conflict.

In Section 4, Chapter III, the president appoints the nominating committee. In Section 1, Chapter IV, the House of Delegates elect the nominating committee.

I therefore move the following amendment to Section 1, Chapter IV of the By-Laws:

In line one, delete (House of Delegates) and substitute President.

In line two, delete the word (elect) and substitute the word (appoint).

Making Section 1, Chapter IV of the By-Laws read as follows:

"The President on the first day of the annual session shall appoint a committee on nominations, consisting of one from each councilor district . . ."

Line nine, delete the word (two) at the end of the line, as this word is superfluous.

Secretary calls attention to the unfinished business presented by Dr. J. B. Gregg, of Sioux Falls District, relative to the reduction of dues. This was fully discussed, also the suggestion by Dr. L. J. Pankow that a committee be appointed by the President to consider the changing of the fiscal year from June 1st to July 1st.

I submit the report of Hon. L. W. Bicknell, Legislative Council. Mimeographed copies have been placed in your hands.

December 13, 1932.

Dr. J. F. D. Cook,
Langford, South Dakota.

My dear Doctor:

With reference to the terms of employment involved in the discussion yesterday, Section 5094 South Dakota Revised Code provides in part as follows:

"No person shall be employed as a legislative counsel or agent for a compensation dependent in any manner upon the passage or defeat of any proposed legislation or upon any other contingency connected with the action of the legislature, or of either branch thereof, or of any committee thereof."

This will preclude the making of the contract suggested by you in your conversation yesterday, and I suggest in lieu thereof that the terms be modified as follows: \$500.00 to be paid on or before January 1, 1933, and the additional sum of \$500.00 payable at the conclusion of the legislative session, or, when final action shall have been taken upon the bill.

Very respectfully yours,

(Signed) LEWIS W. BICKNELL.

February 20, 1933

Dr. J. F. D. Cook,
Langford, South Dakota.

My dear Dr. Cook:

As I advised you on the telephone, the committee on Medicine and Surgery of the House made a favorable report on House Bill No. 2, and recommended that the same, as amended, "do pass."

The bill was on the calendar, not for final disposition, but for its second reading, on Friday, when the committee report was formally submitted to the House. The procedure is that the chairman of the committee merely reports the bill to the House and makes a formal motion that the committee's report be accepted, which motion, if carried, takes the bill to the calendar for final disposition on the following day.

I inquired of a number of members as to the attitude of the House and the general impression was that the recommendation of the committee would receive favorable consideration, and that the House would follow their recommendation.

When the bill was reached on the call, Dr. Bettleheim made the formal motion that the committee report be adopted, which would have sent the bill to the calendar with the amendments approved. Without a roll call this report was rejected. The vote was close and while I could not

hear clearly from where I was in the gallery it appeared to be about even. The chairman was in doubt and called for the vote again, and, apparently, on a rising vote, the motion was rejected by a vote of 44 to 37.

I am satisfied that his result could have been avoided if any of our friends on the floor had been sufficiently interested to ask for a roll call vote, but, before I could reach the lobby and send for Dr. Bettleheim, who was in charge of the bill, the House had proceeded to other business.

While I may be subject to criticism for having failed to foresee this move on the part of the opponents of the bill, I am advised that within the last five sessions this situation has never arisen. The result of this vote took the opponents of the bill as much by surprise as myself, and there was a conference held at which Bettleheim and I and Linstad, attorney for the chiropractors, and one or two other members were present, to determine the effect of this vote. It was finally decided that the vote would not defeat the bill but merely left it in the House, but had the effect of striking out and defeating the amendments.

We, therefore, found ourselves with the bill before the House, but without any of the amendments which we had incorporated to meet objections. A motion was then made by Kleinsasser indefinitely to postpone the bill, and I asked Bettleheim to have a roll call on this, and he agreed to do so. Kleinsasser then withdrew his motion. I then sent for Dr. Bettleheim again and suggested that he move to place the bill on the calendar, and offer the amendments from the floor, which would have returned it to its former status, and this he agreed to do, but he pointed out quite properly that the calendar for that afternoon was very heavy and some highly controversial matters were up and the House was not in a temper to give favorable consideration to the motion, and suggested that we let the matter go over until the next day, thereby giving us a chance to do some work during the evening on behalf of the bill with some of our friends on the floor.

He pointed out also that Kleinsasser had withdrawn his motion and consequently there was no danger of immediate action.

I agreed to this course but remained in the Capitol Building and kept in touch with the situation. Just before the house adjourned Kleinsasser renewed his motion for indefinite postponement, and, again, because we had no one on the floor really interested in the bill, this motion was

put to a viva voce vote and was declared carried, which definitely ends the matter for this session.

We could only bring it back to the floor by a two-thirds vote, and we cannot command any such majority.

As this matter will undoubtedly come forward again, I submit some suggestion, based upon our experience this time, which may be helpful in the future:

1—*Preparation*—I think the Medical Association waited too long before launching their campaign for this bill. For one thing, they did not have any doctors upon whom they could rely in either house of the legislature. On the other side the chiropractors had Dr. Kleinsasser, who is a man of more than ordinary education and intelligence, and was well advised. He was vitally interested in opposing the bill and watched every corner. While we had plenty of friends on the floor none of them cared to take the lead and Dr. Bettleheim, chairman of the committee, having the bill in charge, was not only not enthusiastic, he was absolutely indifferent, and his co-operation was only obtained by the use of some outside influence which I found available. In this state of mind, of course, he was perfectly willing to see the bill die without a formal fight on the floor. It is my recommendation that before we bring this matter forward again the association have several doctors stand for the legislature, putting one on the Republican and one on the Democratic tickets in several counties, thereby insuring that your profession will be adequately represented. If we had had one man on the floor as active and interested as Kleinsasser was against us, we could have gone forward successfully.

2—*Support of the Bill*—Except for the members of the council there was very little co-operation on the part of the Doctors of Medicine throughout the state. Most of them appeared to be indifferent and some were actively against us. They were requested by you to contact their representatives. My correspondence file discloses that a very few did so, and furnished you with a report. For the most part they were entirely inactive and did not even send letters to the representatives to give the bill some apparent support. Nothing whatever was done to procure active support of the persons outside of the profession in most cases.

3—*Tactics in Opposition to the Bill*—The opponents of the bill not only had Dr. Kleinsasser on the floor, who, as I have pointed out, was very well advised, and was himself much less objectionable than most chiropractors because he is

better educated than most of them, but from the outset they inaugurated a campaign in opposition to this bill, which was well managed and apparently carried out. As I contacted the various representatives I was told repeatedly that more letters in opposition to this measure reached them than concerning any other bill before the Legislature. Sometimes the letters numbered twenty or more per day. In addition petitions were circulated and sent in, and the chiropractors enlisted the support of their powerful friends in various parts of the state—men of standing and political influence, and had them visit Pierre and contact members of the Legislature. As might be expected they did not confine their operations to stating the truth. The day before the bill was finally disposed of a very influential Democrat of Sioux Falls came to me and said he was advised that if this bill passed the "Turkish bath" which he patronizes would have to go out of the business. As the result of these numerous activities the sentiment was built up in the House which was reflected in the adverse vote on the committee report.

4—*Conclusion*—The rules of the House do not permit legislative counsel to go on the floor. Consequently the unforeseen event of the adverse vote on the committee report occurred before I could move fast enough to get a page to call one or more men out into the lobby and advise them as to any legislative move before the whole matter had been disposed of. If we had had a doctor who was interested on the floor we would have been ready for them and could have moved promptly to meet the situation which developed.

That we had made distinct progress towards the carrying of the bill is indicated by the action of the opponents in going any length to prevent a record vote.

Our opportunity for success was somewhat diminished by certain unavoidable delays. The amendments to the bill had to be referred to the Council and when at length they authorized me to proceed along the line of the amended bill, and their earlier expressions to me had been adverse, a further delay occurred because I was detained at my house for five days by illness. If we could have moved immediately after the committee hearing, and after the proposed amendment was suggested by Bettleheim, we would probably have gotten our bill through.

I make my acknowledgements to you and to your members of the Council for their unreluctant co-operation in this matter.

Several copies of this report are included for your convenience in advising members of your Council.

Very respectfully yours,
(Signed) LEWIS W. BICKNELL.

Webster, S. Dak.
Feb. 20, 1933.

Dr. J. F. D. Cook,
Langford, S. Dak.

Dear Dr. Cook:

I enclose herewith a formal settlement of the disposition of the Basic Science Bill, which is sent with some carbon copies for your convenience in reaching members of your Council.

I also enclose my statement in accordance with our previous understanding.

All of your original papers are returned under separate cover.

Very respectfully yours,
(Signed) LEWIS W. BICKNELL.

State Medical Association
IN ACCOUNT WITH
Lewis W. Bicknell

Re: Basic Science Bill
PROFESSIONAL SERVICES, balance\$500.00
EXPENSES AS FOLLOWS:
Trip to Pierre, room three nights.....\$ 7.50
Trip to Pierre, room three nights..... 7.50
Trip to Pierre, room three nights..... 7.50
Trip to Pierre, room four nights..... 10.00
Paid for copies redrafted bill 10.00
Copies of statement 2.45
Telephone Calls as follows:
Call Pierre 1.35; call Langford .35;
Call Langford .45; call Pierre 1.35;
Call Langford .35; call Aberdeen .90;
Call Langford .45; call Pierre 1.35;
Call Pierre 1.35; call Pierre 1.35;
Call Aberdeen from Pierre 1.25..... 10.50
-----\$ 55.45
Total\$555.45

Webster, S. Dak.
May 22, 1933.

Dr. J. F. D. Cook,
Langford, S. Dak.

Dear Sir:

I have your letter relative to my statement. If you had advised me that the items for room were objected to I would have been pleased to make an adjustment when this matter was brought to my attention, and I enclose herewith my check for \$32.50, being the amount of the bill which covered the charges for room while at Pierre.

In explanation of this I may say that it is customary for attorneys in business which takes them away from home to charge their traveling

expenses and hotel bills, and their expenditures for meals. I only included the actual room charges and nothing else because the compensation in this matter was considerable.

I wish to renew my expression of appreciation of your many courtesies in connection with this matter.

Very respectfully yours,
(Signed) LEWIS W. BICKNELL.

Dr. John M. Flude, of Hollywood, California, field representative of the American Society for the Control of Cancer, presented the American Society's program for South Dakota, asking that House of Delegates of the State Medical Association co-operate in this program.

Secretary Cook submits the report of Herman G. James as to the status of the Virgil Scholarship.

My Dear Mr. Cook:

I have looked up the record of the Virgil scholarship to date.

1929—Mamie Waara, Buffalo, S. D.\$60.00
1930—Dorothy Cole, Madison 60.00
1931—Agnes Schmit, Castlewood 60.00
1932—Ervie Lovejoy, Vermillion
(Interest not paid, no cash award.)

Very truly yours,

(Signed) Herman G. James
President of the University of S. Dak.

Being no further business the motion to adjourn was made and carried. 6:00 P. M. Monday, May 15, 1933.

SECOND MEETING OF THE HOUSE OF DELEGATES

7:30 A. M. Wednesday, May 17, 1933

The second meeting of the House of Delegates was called to order by President Dr. J. R. Westaby.

Secretary Cook called roll. Following members present: Drs. J. R. Westaby, E. W. Jones, W. G. Magee, J. F. D. Cook, E. A. Pittenger, M. J. Hammond, C. E. Sherwood, B. M. Hart, A. S. Rider, S. M. Hohf, J. L. Stewart, H. R. Kenaston, A. E. Bostrom, W. A. Bates, B. C. Murdy, J. D. Alway, J. B. Vaughn, H. B. Martin, H. D. Sewell, W. R. Ball, F. J. Tobin, Goldie Zimmerman, G. E. Van Demark, J. C. Ohlmacher, Ina Moore Freshour, F. S. Howe and P. D. Peabody. Quorum present.

Secretary read the minutes of the first meeting of the House of Delegates. Correction received and recorded. Motion moved and seconded that the minutes stand approved as read. Motion carried.

Report of the Nominating Committee by Dr. P. D. Peabody. Nominations for president-elect: Drs. W. G. Magee and B. M. Hart. Nominations for vice-president: Drs. A. S. Rider and J. L. Stewart. Nominations for councilors as follows: Third District, Dr. C. E. Sherwood; Fifth District, Dr. J. C. Shirley; Sixth District, Dr. B. A. Bobb; Seventh District, Dr. N. J. Nessa. Delegate to A. M. A. was elected for two years at the session a year ago, Dr. W. A. Bates, delegate, and Dr. J. F. D. Cook, alternate. Place of meeting for 1932, at Mitchell.

Dr. P. D. Peabody moved the adoption of the report of the committee. Motion seconded and carried.

President Dr. J. R. Westaby appointed the following tellers: Drs. S. M. Hohf, chairman; J. D. Alway and B. C. Murdy. Upon ballot for president-elect, Dr. W. G. Magee received twenty-three (23) votes and Dr. B. M. Hart received four (4) votes. Dr. A. S. Rider received twenty-two (22) votes and Dr. J. L. Stewart received five (5) votes for vice-president. Total number of votes cast, 27. Dr. W. G. Magee having a majority of votes cast was declared elected president-elect. Dr. A. S. Rider on vote was duly elected vice-president.

Motion moved and seconded that the secretary be instructed to cast the vote of the association for the councilors as nominated. Motion carried. The vote of the House of Delegates is cast as directed in your motion—Secretary.

Motion moved by Dr. M. J. Hammond, and seconded, that we accept invitation of Mitchell for the 1934 meeting. Motion carried.

Report of the Committee on Resolutions by Dr. J. B. Vaughn.

RESOLUTION—CANCER PROGRAM

Resolved, That the Cancer Committee of the South Dakota State Medical Association shall be and is hereby authorized to engage in an educational campaign to further the knowledge of the diagnosis and treatment of cancer:

That the program as recommended by the American Society for the Control of Cancer, or some similar program, whereby the facilities of all available educational agencies be concentrated for an initial period of one year on the subject of the education of the medical and nursing professions on cancer of the breast:

That the assistance offered in this program of the State Medical Association by the American Society for the Control of Cancer be accepted, and;

That this program have our approval and support.

(Signed)

A. E. BOSTROM, M.D.
J. C. OHLMACHER, M.D.
P. D. PEABODY, M.D.

May 16, 1933.

RESOLUTION—TUBERCULOSIS ERADICATION

Whereas, the prevalence of tuberculosis in dairy cattle is an established fact, and

Whereas, the dairy and meat products from tuberculosis animals may constitute a source of danger to the health of our citizens, therefore,

Be It Resolved, That this association recommend that all municipal authorities throughout the state give serious consideration to the adoption and enforcement of measures designed for the purpose of eradicating tuberculosis from our food producing animals and to measures designed for the purpose of rendering all animal food products safe for human consumption. Local meat inspection of all slaughter animals and tuberculosis testing of cows supplying milk should be provided to effectively safeguard the health of our people, and

Be It Further Resolved, That the members of this association use their influence with, and extend their co-operation to, local boards of health for the prompt and complete accomplishment of these ends.

A. E. BOSTROM, M.D.
J. C. OHLMACHER, M.D.
P. D. PEABODY, M.D.

Dr. J. B. Vaughn moved the adoption of the report of this committee. Motion seconded and carried.

Report of the Committee on Memorials and Resolutions, by Dr. J. B. Vaughn.

RESOLUTION

Vote of thanks to those men who have given of their time and talent in making the Scientific Program a success. Those who made possible the scientific exhibit of X-ray films, and specimen of tubercular pathology.

To the Huron District Society as hosts for their splendid co-operation in supplying clinical material for the scientific program, also their hospitality and entertainment.

To the Woman's Auxiliary of Huron District

for their hospitality and entertainment of the visiting wives, daughters and mothers of our members and visitors.

(Signed)

S. M. HOHF, M.D.
H. R. KENASTON, M.D.
J. B. VAUGHN, M.D.

By the Secretary.

Moved and seconded the adoption of the report of the Committee on Memorials and Resolutions. Motion carried.

Report of the Committee on Amendment to the Constitution and By-Laws, by Dr. W. A. Bates.

In comparing Section 4, Chapter III, with Section 1, Chapter IV, I find they conflict.

In Section 4, Chapter III, the President appoints the nominating committee. In Section 1, Chapter IV, the House of Delegates elect the nominating committee.

I therefore move the following amendment to Section 1, Chapter IV of the By-Laws:

In line one, delete (House of Delegates) and substitute President.

In line two, delete the word (elect) and substitute the word (appoint).

Making Section 1, Chapter IV of the By-Laws read as follows:

"The President on the first day of the annual session shall appoint a committee on nominations, consisting of one from each councilor district . . ."

Line nine, delete the word (two) at the end of the line, as this word is superfluous.

Referred to the Reference Committee: Drs. W. A. Bates, E. W. Jones and J. F. D. Cook. Reference Committee report the adopting of the amendment.

(Signed)

W. A. BATES, M.D.
E. W. JONES, M.D.
J. F. D. COOK, M.D.

May 17, 1933.

The committee recommend that the dues for 1934 be reduced to \$5.00.

On motion the recommendation of the committee was adopted.

Huron, S. Dak.
May 15, 1933.

Doctor Cook:

Please write my motion to bring the vote of the deliberations of the delegates before the body

of the Medical Society; leaving the present Council and House of Delegates as it is under our Constitution and By-Laws but changing the By-Laws so that the entire body may vote on nominations presented by the nominating committee and any other subject which they (House of Delegates) may desire to bring before the Society.

(Signed) A. E. BOSTROM, M.D.

Referred to Reference Committee on Amendments to By-Laws.
May 15, 1933.

Your committee beg to report unfavorable on the above resolution.

(Signed)

W. A. BATES, M. D.
E. W. JONES, M.D.
J. F. D. COOK, M.D.

May 17, 1933.

Roll call requested by the proponent of above resolution. Upon roll call the committee report was sustained as follows: Yea, 21; no, 4.

A. E. Bostrom moved that the above resolution be referred to the District Societies. Upon roll call the vote was as follows: Yea, 10; no, 16. The motion was lost.

Report on Publications by Dr. G. G. Cottam. Read letter from the business manager of the JOURNAL-LANCET.

Dr. G. G. Cottam, of Minneapolis, presented a communication from the JOURNAL-LANCET, in which they offer to reduce the subscription price to \$1.00 per year for members of the State Medical Association for the year 1934. Motion was duly made and seconded that the reduction and subscription to the JOURNAL-LANCET be approved. Motion carried.

Dr. A. E. Bostrom moved that we extend a vote of thanks to the JOURNAL-LANCET for their co-operation. Motion seconded and carried.

Dr. P. D. Peabody introduced Dr. N. T. Owen, of Rapid City, who brought up the matter of the healing art in our state, presenting letters and opinions of Dr. Wm. C. Woodward, of the Bureau of Legal Medicine, American Medical Association.

Moved and seconded that this matter be referred to the Council at noon session, and that Dr. Owen be invited to attend. Carried.

Motion made and seconded to adjourn. Carried.
9:00 A. M. Wednesday, May 17, 1933.

J. F. D. COOK, M.D.,
Secretary-Treasurer.

FIRST MEETING OF THE COUNCIL

8:00 P. M. Monday, May 15, 1933

Council called to order by the chairman, Dr. H. R. Kenaston.

Roll called by Secretary Dr. Cook.

Following members present: Drs. J. R. Westaby, E. W. Jones, W. G. Magee, J. F. D. Cook, E. A. Pittenger, M. J. Hammond, C. E. Sherwood, B. M. Hart, E. B. Taylor, B. A. Bobb, A. S. Rider, S. M. Hohf, J. L. Stewart, H. R. Kenaston, A. E. Bostrom and W. A. Bates.

SECOND MEETING OF THE COUNCIL

12:15 P. M. Wednesday, May 17, 1933

Meeting called to order by Chairman Dr. H. R. Kenaston.

Dean Searles, of Brookings, as guest and fraternal delegate from the South Dakota State Pharmaceutical Association, addressed the Council, calling attention to the following test of U. S. P. drugs. Comparing the U. S. P. prices with the proprietary prices. The physician should specify U. S. P. drugs in writing prescriptions.

A COMPARISON OF THE COST OF U. S. P. AND IDENTICAL PROPRIETARY SUBSTANCES

U. S. P. NAME	PROPRIETARY NAME
Acetanilid .....\$0.12 oz.	Antifebrin (Winthrop) .....\$0.19 oz.
Acetphenetidn ..... .20 oz.	Phenacetin (Winthrop) ..... .63 oz.
Acetylsalicylic Acid ..... .15 oz.	Aspirin (Bayer) ..... .85 oz.
Anidopyrine ..... .44 oz.	Pyramidon (Metz) ..... .82 oz.
Barbital ..... .70 oz.	Veronal (Winthrop) 3.00 oz.
Barbital Sodium ..... .75 oz.	Veronal Sodium (Winthrop) 3.00 oz.
Cinchophen ..... .46 oz.	Atophan (Schering & Glatz) 2.75 oz.
Ethyl Aminobenzoate ..... .65 oz.	Anethesin (Abbott) 1.60 oz.
Gusiacol Carbonate ..... .27 oz.	Duotal (Winthrop) 1.07 oz.
Methenamine ..... .13 oz.	Urotropin (Schering & Glatz) ..... .60 oz.
Phenobarbital 1.95 oz.	Luminal (Winthrop) 6.90 oz.
Silver Protein Mild ..... .60 oz.	Argyrol (Barnes) 1.50 oz.
Silver Protein Strong ..... .55 oz.	Protargol (Winthrop) 1.25 oz.
Sulphonmethane ..... .60 oz.	Sulphonal (Winthrop) 1.70 oz.
Sulphonethylmethane ..... .40 oz.	Trional (Winthrop) 1.90 oz.
Theobromine Sodio-Salicylate ..... .30 oz.	Diuretin (Billhuber) 1.85 oz.
Thymol Iodide ..... .68 oz.	Aristol (Winthrop) 1.80 oz.
Total .....\$8.85	Total .....\$31.41

The total cost of an ounce each of these substances under the proprietary name is.....\$31.41
 The total cost of an ounce each of these substances under the U. S. P. name is..... 8.85

The cost of the proprietary name to the consumer is.....\$22.56

SPECIFY U. S. P. PRODUCTS—THEY ARE RELIABLE

Current prices late 1932.

Report of Legislative Counsel L. W. Bicknell has been mimeographed and placed in your hands. This report also appears in the printed transactions of the House of Delegates. The financial report of L. W. Bicknell for legislative expense be considered.

Dr. C. E. Sherwood moved, seconded by Dr. A. S. Rider, that the report be approved. Carried.

Secretary Cook presented a plan of Minnesota's of increasing their membership by issuing a card of membership to each member of their society.

With reference to this, Dr. E. W. Jones moved that that be submitted to the next meeting of the Council. At that time Dr. Cook will have some information as to the cost.

Motion made and seconded to adjourn. Carried.
 9:00 P. M. Monday, May 15, 1933.

J. F. D. Cook, M.D.,
 Secretary-Treasurer.

Roll call—quorum present. Reading of the minutes of the first meeting of the Council.

Moved minutes approved as read. Seconded and carried.

Fraternal delegate to the South Dakota State Pharmaceutical Association, Rapid City, June 26, 27, 28, 1933: Dr. B. M. Hart, Onida.

Fraternal delegate to the Dental Association. Secretary Cook presented letter from Dr. J. C. Ohlmacher, the contents of which were discussed and it was decided to have the case referred to the Council and county attorney in the county in which the case developed.

Dr. N. T. Owen, of Rapid City, brought up the matter of the healing art in our state, presenting letters and opinion of Dr. Wm. C. Woodward, of the Bureau of Legal Medicine, American Medical Association.

Dr. C. E. Sherwood moved that the chairman appoint a committee to consider this material. Seconded and carried.

Chairman appointed Drs. A. S. Rider, J. L. Stewart, J. R. Westaby.

Dr. J. F. D. Cook moved that the offer of the JOURNAL-LANCET at \$1.00 subscription rate for the year 1934 be adopted by the House of Delegates be concurred in. Seconded and carried.

Dr. B. M. Hart read the report of the Advisory Committee co-operating with the State Board of Health. Verbal report.

1:30 P. M. Wednesday, May 17, 1933.

J. F. D. COOK, M.D.,
Secretary-Treasurer.

Presidential Address*

J. R. Westaby, M.D.
Madison, S. D.

MEMBERS of the South Dakota Medical Association: It gives me a great deal of pleasure to address you at this time. I want you to know that I appreciate deeply the high honor which this body conferred upon me at its last session at Watertown. I appreciate this especially when I consider that I have been essentially a general practitioner and that there are eminent specialists in our ranks. I have often wondered just where the distinction did come between the specialist and the general practitioner, but a great educator has figured it out for me. The specialist has his patients trained to become ill only during his office hours, while the general practitioner may be called off the golf course any time. But whether we are specialists or general practitioners we all have matters of vital importance confronting us in this year of 1933, and it is concerning a few of these problems that I wish to speak now.

As your president it has been my privilege to visit all but one of the district medical societies during a regular meeting and to come in contact with the type of work the members are doing. It was a real pleasure to see the keen interest taken in these meetings and I am sure that I gained as much as anyone from the discussions and explanations given, which goes to show that the members of this association are anxious to gain the knowledge of every advancement of scientific medicine and are wide awake to watch the results of their investigations and to report their findings to their fellow practitioners.

But our association has not only been working along scientific lines this past year, but along governmental lines as well, I speak in particular about the Basic Science Bill.

Two years ago a program of education was started among the members of this association preparatory to the introduction of certain legis-

lative measures designed primarily for the protection of the public from the evils arising from individuals unqualified to practice the healing art in this state.

Last year Dr. W. A. Bates made a special effort to acquaint the medical men with the advantages of such legislation, and made an appeal to every member in the association to get in touch with the men who were not members to interest them in helping back a legislative program that would place South Dakota on an equal rank with other progressive states around us in an effort to keep the racket out of the care and treatment of the sick and injured.

Dr. W. C. Woodward, director of the Bureau of Legal Medicine and Legislation of the American Medical Association, was present at our last annual session and went into every detail of the proposed measures to bring about the legislation desired. We asked Dr. Woodward to prepare for us a measure that would fit the needs of this state, and he did draft such a measure which was presented to the Council where it underwent further revision to meet the local needs more completely. The Council then employed legal council, within the state to represent this association at the legislative session this year. The Council met frequently and worked diligently to present a model Basic Science Bill that would be worthy of our association's backing. The Legislative Committees of the Council met with the joint committees of the House and Senate and tried to enlighten them as to the merits of the measure, presenting the evils already existing and the urgent need of preventing further embarrassment by more delay in the enactment of an adequate protective measure in the interest of public welfare.

Unfortunately there were no actively practicing physicians in either house or senate this year, the dominating force in the House Committee being a non-medical man with a Basic Science education. He soon succeeded in so manipulating

*Presented at the Fifty-second Annual Session of the South Dakota State Medical Association, at Huron, S. D., May 16, 1933.

the spine of the measure as to give it a serious adjustment and even succeeded in getting the consent of our legal advisor to agree to his proposed changes. When I learned of the illness of the measure and how it had been crippled by this adjustment I consulted our secretary, Dr. J. F. D. Cook, and we came to the conclusion that we had better bury the bill, but our attorney insisted that the adjustment was made in good faith, and that he would like to explain in detail what the measure stood for as amended. The Council was again called to Pierre, and the majority voted to permit the bill to go to the House as amended. Our attorney encouraged the Council members by assuring them that he had made sufficient contacts with the members of the legislature to obtain their support of the measure and that if there were features that proved undesirable they could be remedied at another session of the legislature. The fate of the measure is now history. My advice is that we should not let the Basic Science Bill drop as that will only increase the burden of the physicians of the state, will tend to cheapen the practice of the healing art in South Dakota, and absolutely fail to give the public any protection from individuals or cults that desire to come in and fleece it. Minnesota had its failures with similar measures, but kept at it until a measure was passed that was adequate to protect its people with the result that the unqualified practitioners are being eliminated and their places are being filled with qualified members of the profession worthy of the public trust. What Minnesota has done, we can do. All that we need to succeed is more and better co-operation and understanding among the medical men in our state. We can solve our problems if we will, and we must solve them if we expect to make South Dakota free from exploitation and graft by every scheme and imagination of the unscrupulous.

Medical quackery is only one of the many serious and perplexing problems confronting the medical profession for solution. It is high time we became concerned about them. Economic conditions in every line of business and profession are forcing changes that are sure to effect every one of us. Contract practice, insurance schemes, socialized medicine, and subsidized practice are but a few of the schemes proposed to destroy the service the physician now renders his patients, and substitute therefore an inferior service similar to that now found in many countries of Europe. These proposed changes are a reflection of the dissatisfaction with things and

conditions as they exist today. The public is not entirely to blame. They are not able to keep pace with the rapid changes taking place about them. It is our duty and privilege to make the adjustments necessary to continue the relationship between physician and patient that will render more efficient service than ever before.

Let us consider briefly some of the proposed changes and see how they may concern us as physicians. Soon after Mr. Hoover became President of the United States, he appointed commissions to investigate many and varied conditions affecting the public welfare. One of these commissions was charged with the investigation of the cost of medical care. After nearly four years of research and debate, a report known as "The Majority Report of the Commission on the Cost of Medical Care" was published. This report being broadcast to the general public without any explanation and without the proper preparation of the public to correctly interpret the facts presented, has caused it to misunderstand the information given and has caused an unjust reflection on the medical profession. Instead of enlightening the public, the report confuses it and instead of offering a solution to the problem of the cost of medical care, the report if carried out will very definitely complicate and increase the cost, and will institute so much graft into every phase of its administration as to make the service rendered the patient inefficient and unworthy of the American people.

An analysis of the recommendations for the Majority Report of the Committee on the Cost of Medical Care, reveals that if the advice of the committee is carried out, medicine would be practiced in groups. The groups would be organized around the already existing hospitals, forming medical centers which would, as we all know, discount the work of the private physician and make all practice subservient to the group. The method of payment for the medical service would be charged to the insurance form of group payment. The argument was advanced that group practice would be a means of reducing the overhead costs as compared with the same service in private practice. In other words the committee stated that the private practice of medicine was a wasteful procedure. The American Medical Association has carried out a very detailed investigation along this line and the report shows that the cost in groups is 43 per cent, which leaves 57 per cent available to the group physicians, while in private practice their study reveals that 38 per cent represents the average overhead, or expense of

operation of the practice of medicine, leaving 62 per cent as the net to the physician.

Advocates of the new method explain that the expense of the group practice of medicine would be met by a certain insurance principle which when applied would also make possible an extension of public health activities, and a more satisfactory way of caring for the indigent sick. Dr. R. E. Scammon, Dean of Medical Sciences at the University of Minnesota, and an authority on insurance, stated recently at the Northwest Regional Conference of Physicians that "It is generally proposed that the bill for the medical care be spread out in the form of insurance, that this insurance be bought voluntarily by individuals or if that failed that some form of compulsory insurance be established."

We can see that this proposed form of group practice is fallacious, not only from the standpoint of the individual physician, but financially as well.

It takes a good insurance salesman to make a living selling life insurance, and life insurance is sold against a certainty (death), while health insurance is sold against something very indefinite and would therefore cost much more to sell. It costs more than 30 per cent to sell life insurance, and if health insurance costs more it would be beyond the reach of the most of us, and would certainly very materially increase the cost of medical care to such an extent that it would not be practical. Compulsory insurance would be virtually a tax and it has been estimated that medical care paid for under this type of insurance would be about \$30 per person per year. This would cause an increase in the present tax bill of at least 25 per cent. A red flag in the face of every taxpayer.

Dr. Scammon predicts that both voluntary insurance protection and compulsory insurance protection would fail, and points to the withdrawal of every large insurance company from the disability clause feature of their contracts now sold, to prove that it cannot be made practical.

Any insurance scheme to attempt to carry the cost of medical care will be dangerous, to both the public good and to the class of service rendered by the insurance subsidized medical profession, and will tend to make a racket out of the practice of medicine in this country.

The medical profession is up against the most momentous problem it has ever been called upon to solve and the critical question is, are we going to co-operate and plan to bring about a solution of the difficulties confronting us or are we going

to let the politician do it for us and then pay the price the rest of our lives?

Syndicates are already organized to sell insurance schemes to hospitals and to groups of physicians and they are not philanthropic organizations either. They are after the money and will get 40 to 70 per cent of the cost of medical care in the territory in which they operate. Can hospitals and physicians even in groups pay 40 to 70 per cent of their income to such an organization and continue to give real honest to goodness service to the sick?

Dr. R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, states that "During these times, the medical profession cannot afford to lower its standards; it cannot afford to relax from its conception of the best ideals for medical practice, a great temptation exists during such times as these for men to accept most any kind of an offer of a purely financial nature, because hunger and financial distress are sufficient argument for their action."

What is the solution of the problem? Every district, county and state medical society can do something to inform its members completely and accurately of the conditions which will affect them locally, and they can then take steps to remedy them satisfactorily and make it absolutely unnecessary to overthrow the present methods of medical practice.

It seems to me that in South Dakota we might get better co-operation of the medical men if we made it the duty and the privilege of the local medical societies to care for the indigent sick. Iowa has handled this problem very well through its so-called "Unit Plan," which has greatly improved the service to the poor and is not such a burden on the physician, since the contracts for the service are made with the officers of the local society and often fees up to 50 per cent of the standard fee are paid by the county for work that formerly was a forced financial burden on the individual physician.

What can be done for the indigent by the county medical society can be extended to include others, will restore the confidence of the public in the profession, and will demonstrate beyond a doubt that physicians can and will work together; that they are able to solve and control their problems.

Another thing the men in Iowa are doing that is very commendable is the establishment of the Speakers Bureau, organized by the state society for the purpose of keeping the medical men in

touch with scientific advance and the informing of the public regarding the facts of medical care and progress. Carefully arranged courses are given once a week for eight or ten weeks at the medical centers and the best men obtainable conduct the courses in four-hour meetings.

Our medical association might do well to conduct similar meetings or courses of instruction to keep us abreast of the times, acquaint us with the practical advancement of scientific medicine, and also make it possible to associate with our fellow practitioners and make them think of present day problems as professional men should think of them.

South Dakota is served largely by the general practitioner, he makes up the majority of our numbers. His job is not an easy one, and if he is to understand all the possibilities of all sorts of vague early symptoms, determine accurately their meaning, and institute the proper treatment and return his patient to his tasks with as little loss of time and health as possible, he must be a well qualified, keen, up-to-date man, who can at least suspect what cannot early be proven, and who can and will take the proper measures for obtaining the proper treatment and give advice at a time when it will do the most good.

As practitioners of the healing art, we must be ever seeking scientific practical knowledge, to

improve our service to society. We must also be leading citizens in our communities and if need be, leading politicians in order to protect the public from the rackets detrimental to its welfare. It might be wise to see that physicians are on both tickets in the majority of the counties for the next legislature. It certainly was no credit to us to have no representation at the last session.

Someone has said facetiously that the reason physicians get by is because they have inside information. I would urge that we obtain inside information not only about our own work, but also about new trends in words affairs, in order that we may make the medical profession fit into this new scheme of things, this New Deal as it were. We must abandon some of our old practices and take on the new, but we must ever be alert lest some of these new forces creep in and destroy not only the ideals of our profession, but our service as well.

In closing I wish to express my appreciation to you men who have served as officers, delegates and councilors. You have helped tremendously during this year and I want you to know that I appreciated the willingness to co-operate, to sacrifice time and effort when it was needed to maintain the standards of our profession and to increase our service to the people of South Dakota.

DISTRICT AND COUNTY ROSTER

ABERDEEN DISTRICT MEDICAL SOCIETY—NO. 1

PRESIDENT

Kraushaar, J. O. F.Aberdeen

VICE-PRESIDENT

Pittenger, E. A.Aberdeen

SECRETARY-TREASURER

Calene, John L.Aberdeen

Adams, J. F.Aberdeen
Aldrich, H. H.Eagle Butte
Alway, J. D.Aberdeen
Bates, W. A.Aberdeen

Bruner, J. E.Frederick
Calene, J. L.Aberdeen
Cook, J. F. D.Langford
Cooley, F. H.Redfield
Countryman, G. E.Aberdeen
Creamer, F. H.Dupree
Gelber, M. R.Aberdeen
Hogeboom, C. F.Bowdle
Jackson, E. B.Aberdeen
Jones, T. D.Aberdeen
Keegan, Agnes M.Aberdeen
King, H. I.Aberdeen
King, Owen.Aberdeen

Kraushaar, J. O. F.Aberdeen
Lowe, C. E.Mobridge
Mayer, R. G.Aberdeen
McCarthy, P. V.Aberdeen
Murdy, B. C.Aberdeen
Murdy, R. C.Aberdeen
Olson, C. O.Groton
Pittenger, E. A.Aberdeen
Potter, G. W.Redfield
Ramsey, E. T.Clark
Ranney, T. P.Aberdeen
Whiteside, J. D.Aberdeen

WATERTOWN DISTRICT MEDICAL SOCIETY—NO. 2

PRESIDENT

Johnson, A. E.Watertown

VICE-PRESIDENT

Freeburg, H. M.Watertown

SECRETARY-TREASURER

Jorgenson, M. C.Watertown

Bartron, H. J.Watertown

Bates, J. S.Clear Lake
Brown, H. Russell.Watertown
Christensen, A. H.Clark
Freeburg, H. M.Watertown
Hammond, M. J.Watertown
Johnson, A. E.Watertown
Jorgenson, M. C.Watertown
Kenney, H. T.Watertown
Lockwood, J. H.Henry
Magee, W. G.Watertown

McIntyre, P. S.Bradley
Richards, G. H.Watertown
Rowe, A. N.Estelline
Scallin, Paul R.Clark
Sherwood, H. W.Doland
Tarbell, H. A.Watertown
Vaughn, J. B.Castlewood
Watson, E. S.Estelline
Williams, C. A.Doland

MADISON DISTRICT MEDICAL SOCIETY—NO. 3

SECRETARY-TREASURER	Engelson, C. J. Brookings	Sherwood, C. E. Madison
Miller, R. K. Madison	Jordan, L. E. Chester	Westaby, J. R. Madison
Baughman, D. S. Madison	Kellogg, H. E. Brookings	Westaby, R. S. Madison
	Miller, R. K. Madison	Whitson, W. E. Colman

PIERRE DISTRICT MEDICAL SOCIETY—NO. 4

PRESIDENT	Hart, B. M. Onida	Morrissey, M. M. Pierre
Morrissey, M. M. Pierre	Kimbal, O. A. Murdo	Riggs, T. F. Pierre
SECRETARY-TREASURER	McLaurin, A. A. Pierre	Robbins, C. E. Pierre
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The Failure of Medical Treatment of Pulmonary Tuberculosis*

Francis W. Heagey, M.D.**
Omaha, Nebr.

THE encouragement we take from a discussion of the work of anti-tuberculosis agencies in America during a little over a quarter of a century past, is so great that it seems almost a sacrilege to offer the suggestion that the relatively bright outlook is only a silver lining and not, in itself, a source of light. I am wondering if we are not deceiving ourselves—if we are not victims of a false optimism engendered by certain fallacies prevalent with regard to tuberculosis. For very certainly the cloud is still there.

Why should we be over optimistic? Why should we be optimistic at all? We have cut the death rate to less than thirty-five per cent of the 1905 death rate. The figures look good; they cheer and encourage—while the fact remains that *Tuberculosis still heads the list of man-killers!*

I think we will all agree that sixty to eighty per cent of the patients with sputum-positive pulmonary tuberculosis die, in spite of all our devices, at some time between one year and ten years after infection. It is with this class of tuberculosis that I am concerned. It is the common, garden-variety of pulmonary tuberculosis that is the subject of this paper. I am leaving out all education and prevention measures, and all consideration of treatment of primary sensitizations and cases with positive von Pirquet or Mantoux except as they are concerned, by contact, with sputum-positive cases.

For a disease that is curable at all, a mortality rate of sixty to eighty per cent is too high. It is far too high to be brushed aside and buried under glad tidings of success in prevention and education programs. I think it is time to compare the gratifying success of prevention measures under the National Tuberculosis Association, with the discouraging non-success of medical treatment of sputum-positive pulmonary tuberculosis.

The first fact that startles us when we make this comparison is that we *have no true medical cure* for this type of the disease. Our procedure is exactly the same as in the treatment of mere sensitization, and in prevention following con-

tact. In none of these courses can we report to a specific drug case as in the exposure case, we try to put the body in such shape that it can bring its own germ-fighting organization into effect against tuberculosis.

How much sense is there in this method?

A good sound body is equipped to destroy tuberculosis germs in such numbers as are normally present in a good sound body. It is about as reasonable to expect a healthy body to destroy all the germs produced in the germ factory of a positive lung cavity as it is to expect the body harboring such a factory ever to become a healthy body. Of course we ought to keep our spirits up; of course we ought to keep our courage high; but we ought to keep our feet on the ground and look facts in the face. *Sixty to eighty per cent of these patients die.*

What we call successful treatment of pulmonary tuberculosis demands:

1. Death rate not higher than estimated birth rate.
2. Complete restoration of patient within reasonable time.
3. Eradication of major discomfort and anguish.
4. Prevention of new cases.
5. Prevention of crippling and disability.

How nearly successful is the average treatment? And what is the treatment? Let us say, a patient with sputum-positive tuberculosis consults his doctor and the diagnosis is made. He is put to bed, hypernutrition is prescribed as well as fresh air and sunshine. Perhaps ultra-violet ray treatments are used. He is subjected to so-called medical discipline and instructed in matters of hygiene that are more correctly placed as criteria of personal cleanliness.

All this is not a specific treatment for tuberculosis. We do the same things for a patient suffering from diseases for which there are specific countervailing agents. We do the same things, just as intensively, for the patient who is regaining strength after severe injury, blood-loss or after surgical operation—when there is no active disease within the body.

The unfortunate tuberculosis patient cannot have serums nor medicines, nor surgical excisions of diseased parts. He is told that the treatment

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of his disease consists in building up his body and all depends upon how he behaves himself. Is that fair? Of course there are variable factors, and much depends upon the patient in the individual case. It is not only unfair—it is out of all reason to make these statements and let it go at that. I believe that far more than eighty per cent of the patients have the will to live, and that far more than eighty per cent of the doctors have the earnest desire to affect cures. This high mortality indicates that we are allowing the responsibility for the present success of treatment to rest upon the wrong shoulders. I believe that neither the patient nor the doctor can do a great deal about it at the present time, and that too little attention is paid to experiment and research on the sputum-positive cases, as such. I believe that the future success of treatment will depend upon what the medical profession *finds out* about tuberculosis; it will depend upon methods now being developed but not now being generally used.

When we consider the variable factors that must affect the outcome in every individual case, we find the odds so discouraging that we wonder why pessimism is not an *in*-variable factor. The variable factors on which mortality depends include such things as (1) the patient's financial situation; (2) decision between home and sanitarium treatment; (3) rest or activity; (4) stage of disease when diagnosis is made; (5) intelligent medical supervision; (6) duration of treatment (7) type of disease (bovine or human), and (8) race. The last two are accidents, rather than variables, in that they do not depend upon anything the patient or his doctor may or may not do. All of the first seven are dependent upon many extraneous influences as well as interdependent upon each other. All are important; but the one affecting to the greatest degree the success of treatment is the length of time required to show appreciable effect. This long drawn-out treatment exhausts the patient's finances, brings him home from the sanitarium early; exhausts his patience and makes him fractious and non-co-operative; and these things, in turn, cause his doctor to lose interest. And when the doctor has no interest in the case, the patient is in a tough spot.

There are many reasons, some of them blame-worthy, some extenuable, why doctors are inclined to lose interest in the treatment of tuberculosis. To recite them all is much like repeating the list of variable factors. There are, however, some circumstances that belong to this classification alone. One is the lack of knowledge of the average physician concerning tuberculosis. Another is his lack of hope. When he finds a

case well advanced, particularly in a young adult, he can expect little reward, by way of results, for his efforts. Again, due to the long period of time required, he is more than likely to lose contact with the patient before he learns what effect has followed his treatment. Patients may leave the city to seek more favorable climate, or for other reasons. The doctor's interest may lag because of resentment of the seeming interference of a public health nurse. His patience may be exhausted by want of co-operation on the part of the patient; or his courage may be deflated because, whatever the patient's willingness to co-operate, he is too poor to buy foods and and pay for care that are necessary to his recovery.

In twenty-five years, the National Tuberculosis Association and its state associations have convinced doctors and the public that there are certain acceptable remedies and no other. It is one thing for an individual to be one of an appreciative public. It is another for him to be patient himself. As patient, he finds it hard to accept the fact that there are no specific drugs or vaccines to help him in his fight. He wants something done for him—which, from his point of view, means something done *to* him. This brings me to my conclusion, in which, possibly there is hope. Perhaps the wish is father to the thought; but this is something only time can tell.

Certain sanatoria report successful treatment of eighty to ninety per cent of cases taken in the early stages. The blue note of the whole situation is contained in the statement of Shirley W. Wynne (N. T. A. 1929, P. 292): "After twenty-five years of warfare, the duration of the disease before diagnosis has not been lessened . . . The average is not less than six months. . . ." Why should we be optimistic, when six months is ample time for a case of primary sensitization to turn into sputum-positive pulmonary tuberculosis? Then consider the patient who goes to his doctor and learns that he has the disease. He wants to live, and he begins his treatment with pathetic optimism. He makes all the sacrifices necessary to successful treatment—of money—of time, of activity, of amusement. He submits cheerfully to a rigorous medical discipline which must, at times, seem more punitive than palliative—and for what? An accident happens. Reinfection takes place, or hemorrhage, or taking cold, or laryngitis; and practically overnight, his slow up-building work of months has been wiped out. He dies and is glad of it—or he lives, and is sorry—sorry because chronic invalidism and crippling disability are the best he can hope for. We call

(Continued on Page 391)

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SPECIAL DIET KITCHENS NEEDED

Modern physicians, in these modern times, find that modern people are quite conversant with diets, especially of the freak order, and it is necessary to spend more time in taking them off, than putting them on some special form of diet. Many of those who inquire what they shall eat, haven't the slightest intention of following directions unless it should, by chance, strike their fancy. There are others who do not find it convenient to comply, because there is no place available for them to secure the articles of diet prescribed.

We can have little sympathy for the fickle, first group, but we must acknowledge sincere interest in the problems of the latter because theirs presents a real need that calls for a better provision or supply. Physicians must take an interest in the establishment of diet kitchens in every community, where, not only properly cooked, but rightly classified and accurately weighed up foods may be had if dietic treatment is to succeed.

A. E. H.

RETROSPECTION

Reminiscence has ever been conceded as the prerogative of those valiant souls whose active years lie in the past. Many of our readers have earned that distinction. Others are still active but nevertheless, enjoy an occasional flop of history's pages, to see what was going on, say 25

years ago. And why shouldn't even the young fledgling find amusement, and sometimes inspiration, in a perusal of the "Who's Who" of that period, in northwestern medicine?

We offer then, for your approval, beginning with this number on page 387 a column of selected events from the files of the LANCET 25 years ago.

A. E. H.

OBSTRUCTIVE LARYNGITIS

In a paper on obstructive laryngitis read at the meeting of the American Medical Association in Milwaukee, Dr. E. S. Platou of Minneapolis, reported that ten per cent of patients with this condition were moribund at the time they were admitted to the hospital. The aggregate mortality from diphtheritic laryngitis was twenty-four per cent in seven hundred and seventy-two cases. The death rate from this disease impresses one with the need of making exact differentiation promptly in that group of conditions commonly designated as "croup." The writer emphasized that direct laryngoscopy was of inestimable value in differentiating various types of laryngitis. According to the experience at the Minneapolis General Hospital intubation was the ideal method of operative treatment in cases where edema was the principal obstructive factor. However, in cases where loose membrane obstructs breathing it was found desirable to remove the obstruction by means of laryngeal suction. This procedure

reduced the necessity for intubation approximately seventy-five per cent and accomplished a significant decrease in mortality. The use of the laryngoscope, the oxygen chamber and prompt intervention with the onset of air hunger were stressed.

This study of obstructive laryngitis is a valuable contribution on a subject that even remains of grave concern to those engaged in the practice of medicine. The condition develops often to the point where emergency measures must be instituted and laryngeal suction has proven to be a procedure of value in selected cases, not only to relieve dyspnea, to decrease the need for intubation and to reduce the death rate.

C. A. S.

EVERYONE IS PRESCRIBING

Physicians themselves are to blame in a certain measure for the innumerable persons practicing medicine.

Technicians of various kinds, nurses, druggists, barbers, beauticians, athletic directors and shoe clerks are practicing medicine. At social functions, every day, advice is given and prescriptions are passed around by lay persons, even in the presence of members of the profession—everyone is practicing medicine. And how they delight in telling about it!

Large and successful industrial corporations, banks, institutions of learning and public utility companies have organized "health services" and "welfare departments" wherein employees and students receive actual medical care at any time they apply whether a physician is present or not. In some cases its humble beginning is a "rest room" presided over by a pay-toilet-qualification attendant who carries aromatic spirits of ammonia, aspirin, sal hepatica, unguentine, iodine and bandages as an interesting and ever increasing sideline. Then along comes a case of asphyx-

iation and contact is made with the resuscitation squad of the fire department and so on and on without interference.

Physicians are to blame for their attitude of tolerance. Proper allowance should be made for emergencies, but surely much of this is neither necessary nor right and the question properly arises if and to what extent the profession should tolerate this condition. Moving picture operators are not imposed upon in like manner. A profession committed to free services for those who cannot pay should first of all be able to distinguish between charity and imposition.

A. E. H.

THE GROWTH HORMONE

Further study is being made, and we expect something startling from a better knowledge of the growth hormone. It is asserted that the type size of animals may be doubled.

It won't make any difference to the camel because he never did expect to pass through the eye of a needle anyway but what will the poor human do? Architects have already reversed the building style of the nautilus to such a point that our living quarters are not only becoming less stately but so decidedly cramped that any corporal expansion is entirely out of the question.

We also fear the consequences of the unregulated use of this growth hormone by irresponsible persons who would upset the prosaics of daily life by their impious arts. There should be a special license required of any who would tinker with the stuff and there is no time to lose. Suggestions will be gratefully received as we are unable to decide whether it should be under the control of the Farm or Live Stock Board or some High Explosive Bureau. It is only fair to expect applicants for permits to put up bonds, take out an additional amount of indemnity insurance and agree to stay on the gold standard.

A. E. H.



25 YEARS AGO

from JOURNAL-LANCET

The corner stone of the Deaconess hospital at Northwood, N. D., was laid on July 7th.



All pupils entering the Fargo, N. D., schools will hereafter be submitted to a medical examination.



Dr. E. Klaveness of Sioux Falls, discussed hernia at a meeting of the South Dakota State Medical Association.



Dr. Henry C. Cooney of Princeton, Minn., is in the East visiting the hospitals, where he will remain several weeks.



Dr. W. E. Ground of Superior, Wis., has opened offices in Duluth for consultation work in surgery and gynecology.



The State Board of Health of S. D., has abolished quarantine for small pox, thus taking the same position as that of the Minnesota Board.



Dr. Roy N. Andrews, who graduated from the university last month, has entered into partnership with his father, Dr. J. W. Andrews of Mankato.



Dr. George D. Edward has moved from Brookings, S. D., to Bruce, where he takes the practice of Dr. Kenney, who will locate in the western part of the state.



Missoula, Montana, has a new detention hospital which would be a credit to St. Paul or Minneapolis, and one which either of the Twin Cities would be glad to have.



Mr. John Till of Somerset, Wis., who treated all diseases by applying a dirty sponge, saturated with croton oil, up and down the spines of the willing, has been prohibited by an order of the court from further practice of this lucrative art.



The Minnesota State Board of Health has abolished quarantine for small pox, and a small township near Mankato has asked the governor to remove the Board or call it the State Board of Disease.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of May 10, 1933

THE regular monthly meeting of the Minnesota Academy of Medicine was held on Wednesday evening, May 10, 1933, at the Town and Country Club. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the president, Dr. C. D. Freeman.

There were 58 members and five guests present.

Minutes of the April meeting were read and approved.

Upon ballot Dr. Paul O'Leary, Rochester, was unanimously elected to associate membership in the Academy.

The following scientific program was given:

DR. A. R. COLVIN (St. Paul) reported the following case:

OSTEOMYELITIS OF THE ISCHIUM OF THE RAMUS

The case I wish to report this evening is interesting from the point of view of pathological anatomy and the rather unusual clinical symptoms. A girl 15 years of age was admitted to the Ancker Hospital complaining of severe pain in the popliteal region and the calf of the leg. The lower extremity was held in outward rotation and attempts at inward rotation caused severe pain in the calf and popliteal region. Her temperature ranged from 101° to 103°. The movements of the hip joint, except internal rotation, were normal. There was no tenderness in the regions where the pain was felt; the pain was thus evidently a referred pain.

A study of the anatomy concerned explains the referred pain. The skin of the region of the calf and popliteal space is supplied by the obturator and lesser sciatic nerves. The external rotators of the hip, the gemelli and obturator muscles, take their origin from the ramus of the ischium surrounding the obturator foramen. From their origin here the tendons are slung around the ischial tuberosity and are inserted into the digital fossa on the inner surface of the trochanter major. Any attempt at internal rotation would exert a very direct pull on the ramus of the ischium. The muscles named are also supplied by the sacral plexus and obturator nerves.

Rectal examination revealed a tender, rather boggy feeling over the bone surrounding the obturator foramen. It is interesting that while tenderness was felt on palpation in the region of the obturator foramen, a pull on this region through the external rotator muscles caused pain only in the popliteal and calf regions.

From these findings it was concluded that we were dealing with osteomyelitis of the ramus of the ischium. An incision was made over the tuberosity of the ischium and a curved forceps passed up along the inner surface of the bone surrounding the obturator foramen. A small amount of pus was formed. The forceps were then taken out and re-inserted along the outer surface of the bone and again a small amount of pus was obtained.

Shortly after this her pain disappeared and internal rotation of the hip was again possible.

This case calls to mind another case of osteomyelitis of the same region which resulted finally in involvement of the body of the ischium and resulted in suppuration in the hip joint, with pathological dislocation.

DR. S. E. SWEITZER, Minneapolis, reported the following case of pellagra, and presented the patient.

PELLAGRA, NON-ALCOHOLIC TYPE

This gentleman is one of 57 cases of pellagra I have had in seven years. Of these 57 cases, 55 have been of the type called alcoholic pellagra. This year I have had two of the non-alcoholic type. This man had a fairly elaborate diet but had no appetite and did not eat much. He had bacon, eggs, bread, meat, potatoes and still he came in with a frank pellagra, with a bullous eruption on the backs of the hands. You can see now on the backs of his hands a thickened condition and the pigmentation that has remained.

This condition of avitaminosis is important for this reason, that in dieting efforts to reduce, it is very easily possible to get quite a serious pathological condition. This man did not have any symptoms at all except the skin symptoms. In pellagra it is possible to have just one symptom; in this individual, an eruption on the back of the hands. In limiting diets, one has to be careful that he does not cut out the vitamins.

The second case of the non-alcoholic type of pellagra was in a sheep herder who had lived principally on hardtack and bologna.

DR. E. L. GARDNER, Minneapolis, read a paper entitled

CALCIUM DEFICIENCY ASSOCIATED WITH FUNCTIONAL GASTROINTESTINAL DISTURBANCES IN ADULTS

DISCUSSION

DR. R. L. LAVAKE (Minneapolis): I would not take the liberty of discussing this paper were it not for the fact that this question of calcium metabolism is a hobby of mine and has from my experience become a matter of importance in my practice of obstetrics and gynecology. It has become a hobby because I came from a family in which spasmodophilia and low calcium balance is rife, and I myself have had to consider my calcium balance for my own comfort. Calcium deficiency is a subject the importance of which, from my observation, is too frequently overlooked.

Dr. Gardner has brought out particularly the more marked cases of calcium deficiency, cases that can be demonstrated by X-rays or have marked symptoms. I would like to bring to your attention the importance of keeping in mind the frequent manifestation of minor grades of calcium deficiency. In obstetrics, this deficiency frequently manifests itself in muscle cramps, Chvostek's sign, headaches, and other tetanoid symptoms and signs. This heightened nerve irritability is a condition that is difficult for one to appreciate who has not been subject to it. To one low in calcium, if

someone makes an unexpected noise, one feels like reflexly hitting him with the first article in sight. A few weeks of high calcium intake plus Vitamin D or sunlight and one feels as calm as can be. This change in nerve excitability is most startling. These minor symptoms may obtain in the presence of an apparently normal blood calcium estimation.

In the April 1, 1933, issue of the Journal of the American Medical Association, Alice R. Bernheim has an article on calcium metabolism that is worth your perusal. It is her opinion that the diet of most people in this country is deficient in calcium. The question is raised as to whether reputed longevity of Bulgarian peasants is not due to the high calcium intake rather than to the much-heralded bacillus of Metschnikoff. Experiments on rats point to a relative longevity of calcium high rats over calcium deficient rats.

So many of my gynecologic patients come in with peculiar headaches and general nerve irritability, especially demonstrable by Chvostek and Trousseau signs and other heightened reflexes. On these, I use calcium therapy even though the blood calcium is apparently normal. In the majority of instances, results are striking. Headaches leave and the patient becomes more calm.

Dr. Gardner mentions menorrhagia, which is a frequent concomitant of calcium deficiency. If menorrhagia continues after diagnostic curettage, one should never remove a fibromyomata uterus for hemorrhage alone until he has thoroughly tried out a high calcium regime. Much meddlesome surgery will in this way be eliminated.

I feel that this is one of the most important subjects that we have had discussed in this Society for some time and would urge you to give it your very careful consideration.

DR. GUSTAV SCHWYZER (Minneapolis): As long as Dr. LaVake excuses himself in discussing this subject because he is a gynecologist, I can do the same because of the veterinary work I am doing of late. I became familiar with this deficiency of calcium in my own cattle. Possibly you may not be familiar with this new fact, but the so-called milk fever which has killed so many cattle has been studied and it has been found that it is due to calcium deficiency. The original thought came from England, and the Minnesota University Farm has done some of the early work. The veterinarian today uses a 10 per cent calcium chloride solution, 100 cc. injected under the skin or intravenously. A cow that is dying, after being given this calcium chloride, will in twenty minutes be up on her feet and feeding. I have had the experience of observing such results with my own cattle.

I thought it might interest you to know that, in addition to what we have learned from Dr. Gardner and Dr. LaVake tonight, this calcium deficiency is found in cattle also.

DR. C. N. HENSEL (St. Paul):

DR. GARDNER (in closing): A good way to check the diagnosis of calcium deficiency in suspected cases is to X-ray the hand along with a control on the same X-ray

film. After treatment this method of examination may be checked and you will find an increase of density along with an improvement of the patient's general condition. It seems that much of our former speculation about the presence of calcium deficiency is justified by these radiographic studies. The extreme case may possibly be non-tropical sprue.

There are just two points to which I would like to call your attention. *First*, what relation has calcium deficiency to water supply? Does water in some localities supply considerable lime besides the dietary, and, if so, is there any excess of magnesium in the same supply? Some of the artesian wells in the Northwest and even in Minneapolis show considerable amounts of magnesium salts. *Second*, I believe we should reserve our conclusions as to the presence of almost universal tendency to a calcium dietary deficiency until after an allowance is made for this water supply.

I have tried in this discussion to keep away from speculation and deal only with objective facts. My impression is that mild cases of calcium deficiency are very common, but we have no absolute proof.

Dr. Hensel spoke about parathyroid hormone. Basing our opinion from our present ideas of parathyroid function, parathyroid extract would be contraindicated, because it probably would mobilize more calcium from the bones.

I wish to thank the gentlemen for their discussion.

DR. H. E. MICHELSON, Minneapolis, gave a lantern slide talk on

THE TUBERCULODERMAS OF THE FACE

Tuberculosis of the skin is not a common condition in Minnesota, while in continental clinics lupus vulgaris in particular is seen very often. The same causative agent produces, in different individuals who are affected, a very different clinical manifestation.

The face is the most common location for tuberculosis of the skin. The type of lesion varies greatly, and the factors that bring about this variation are probably the state of receptivity of the host and the number and manner in which the bacilli are deposited in the skin. Pre-existing dermatoses and the circulatory type of the individual undoubtedly also play a role.

DISCUSSION

DR. S. E. SWEITZER (Minneapolis): I wish to congratulate Dr. Michelson on this excellent presentation. The subject of tuberculosis as manifested in the skin is interesting from the fact that we see so little of it. In Europe one sees a tremendous amount of skin tuberculosis. There are various explanations for this, i. e., the dwellings are so old and there are a lot of germs in the dwellings, the food is not so good as it is here, and they do not have so much sunshine. Also, in Europe they have developed more of an immunity to tuberculosis, and lung tuberculosis is not so severe. Here skin tuberculosis is not so severe; therefore, in Minnesota we should have more lung tuberculosis and not so much skin tuberculosis. For fifteen years I was connected with a tuberculosis institution and was amazed to see how few patients who had lung tubercu-

losis also had skin tuberculosis. The few cases we have picked up through all these years are those Dr. Michelson has seen at the University and I have had a few at the General Hospital. But we see very few, comparatively. Day after day goes by without seeing a case of skin tuberculosis. In Europe one can hardly go through any hospital without seeing a number of cases of tuberculosis of the skin. There must be some reason for this.

As to the question of nomenclature, we think these are all due to the same organism. We give various names for distinction in diagnosis. The cases differ histologically a little bit and also differ in the kind of treatment we wish to give them. They vary in these respects although they are due to the same organism.

The interesting thing in my experience is that we see so few cases of tuberculosis of the skin, and the ones we do see are largely lupus vulgaris, a few tuberculids, and some sarcoid. We see very few of these other cases mentioned. I have not been able to figure out any reason other than that patients in Europe are more strongly immunized and so have a greater tendency to skin manifestations.

The meeting adjourned.

R. T. LAVAKE, 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. C. E. Watz, Le Sueur, has sold his practice to Dr. N. N. Sonnesyn of Butterfield, Minn.

Dr. Chas. J. Kingis is now located at Langdon, N. D., where he has opened offices for general practice.

Dr. J. E. Campbell, South St. Paul, Minn., has sailed for Naples, Italy, where he will spend several months in visiting different clinics.

Mr. C. E. Faulker, who was superintendent of the Washburn Memorial Home, Minneapolis for over 20 years, died at his home in Florida on July 2.

Dr. B. M. Hart, Onida, S. D., was married on June 22, to Miss Jennette Hogansen, of Rochester, Minn. Dr. Hart will continue his practice at Onida.

Dr. F. W. Dimmitt who was in active practice for many years at Red Wing, Minn., died recently at Sherman, Texas. Dr. Dimmitt was 72 years of age.

The June meeting of the District Medical

Society was held at Watertown, S. D., with the usual dinner. The speaker was Dr. T. J. Billion, of Sioux Falls.

Dr. A. E. Hofer, who has resided at Marion, S. D., for the past 33 years, died suddenly last month from an attack of heart trouble while sitting on his lawn.

Drs. J. A. Myers and C. A. Stewart, Minneapolis, were among the guest speakers at the National Tuberculosis association meeting held at Toronto, Canada, on June 26-30.

Dean E. P. Lyon, of the University of Minnesota Medical School was the principal speaker at the June meeting of the members of the Blue Earth Medical Society held at Mankato.

With 6,000 smallpox inoculations already made, and an almost equal number given to combat diphtheria, Minneapolis residents are turning out in ever-increasing numbers for vaccination.

Pukwana, S. D., who have been without the services of a doctor for several months, have secured Dr. J. L. Porter, Wahoo, Neb., and he will open offices for general practice at once.

Drs. M. A. Stern and T. J. Billion, have severed connection with the Sioux Falls Medical Clinic, and have opened offices for private practice, with a modern X-ray machines, electric cardiograph, laboratories, etc.

Dr. W. G. Wendel who was in active practice at Marmarth, N. D., for many years died at Miles City, Mont., on June 1, at the age of 73 years. The doctor was a Pennsylvania School of Medicine graduate.

Dr. James McKeon, St. Paul physician died suddenly from a heart attack on June 8, while attending a medical meeting at Montgomery, Minn. Dr. McKeon was 71 years of age and had been in practice at St. Paul for 15 years.

Dr. Frederick Treon, one of the outstanding physicians of South Dakota, died at the home of his son at Aurora, Ills., on June 19. Dr. Treon had been in poor health for the past two years. He was an active member in the medical and masonic orders.

Dr. Adolph Hanson, Faribault, was awarded a gold medal at the meeting of the Minnesota State Medical Association in Rochester in recognition of his achievement in discovering the active principle of the parathyroid gland and the isolation of its hormone.

The annual meeting of the Scott-Carver Med-

ical Society was held at Chaska, Minn., last month, when the following officers were elected. Dr. E. J. Eklund, Norwood, president; Dr. M. A. Schneider, Jordon, vice-president and Dr. Douglas Ormand, Waconia, secretary.

The annual convention of the South Dakota Hospital association was held in Sioux Falls on July 5. The meeting was attended by representatives of the various hospitals of the state. Dr. H. J. Bartron, Watertown, is president and C. W. Carlson, Sioux Falls, secretary and treasurer.

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). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota, is the speaker. July 19—"Insulin and Underweight;" July 26—"Tumors of the Bladder."

The Wabasha County Medical Society will hold its 65th annual meeting on July 6, at Wabasha, Minn., with the following program: 1. President's Address—"A Country Doctor's First Experience in Obstetrics" by Dr. Wm. B. Stryker, Plainview. 2. "The Diagnosis and Treatment of Specific Urethritis" by Dr. Anson L. Clark, Mayo Clinic, Rochester. 3. "The Use of Maggots in Osteomyelitis and Necrosis, with Illustrative Cases" by Dr. R. C. Radabaugh, Hastings. 4. "Advances in Surgery" by Dr. Waltman Walters, Mayo Clinic, Rochester.

BOOK NOTICE

THE PELVIS IN OBSTETRICS: A PRACTICAL MANUAL OF PELVIMETRY AND CEPHALOMETRY INCLUDING CHAPTERS ON RENETGENOLOGICAL MEASUREMENT. By Julius Jarcho, M.D., F.A.C.S. 140 illus., 51 tables. New York, P. B. Hoeber, Inc., 1933.

This timely work is worthy of the attention of everyone interested in obstetrics.

Dr. Jarcho begins with a historical review that is both erudite and entertaining.

One chapter is devoted to a consideration of the normal pelvis from every standpoint. This is followed by a chapter delineating the abnormalities and deformities of the pelvis. These chapters are quite exhaustive in their scope and most interestingly presented.

Three chapters are devoted respectively to methods of external and internal pelvimetry and the measurement of the foetal head.

The final chapters give a thorough exposition of Roentgen-Ray pelvimetry and cephalometry.

The illustrations are excellent.

In the chapter upon pelvic abnormalities and deformities, particularly valuable are the collections of reports of the incidence and management of the contracted pelvis in foreign and domestic clinics. Dr. Jarcho's discussion of the absolute and relative indication for Cesarean Section is of great interest. It may seem to many that the advantages of a test of labor in borderline cases could have been given more stress. Few men can forget the cases that delivered normally with comparative ease after several excellent specialists advised elective cesarean. The test of labor is the only way that one may determine the two unknown quantities in any labor, namely: first, the hereditary stamina that may allow a woman to push, with surprising ease, a normal sized child through a borderline pelvis; and, second, the moldability of the foetal head. The development of the low cervical cesarean has greatly decreased the dangers of a thorough test of labor, and in this part of the country there is good evidence that a test of labor in borderline cases will make cesarean necessary in only one in 350 deliveries.

One comes away from a study of this book with a feeling that the work should certainly tend to reduce the number of cases that come to grief because of the neglect of careful antepartum mensuration. If so, the book has accomplished its main purpose. One is not so convinced that it will tend to reduce the number of cases that come to grief because of unnecessary cesarean section. This opinion may not be shared by other readers.

Dr. Jarcho has given us a scholarly, practical work of great merit and it is to be hoped that it will be studied widely.

R. T. LAVAKE, M.D.

THE FAILURE OF MEDICAL TREATMENT OF PULMONARY TUBERCULOSIS

(Continued from Page 384)

these things "accidents." We speak of them as "hard luck." Hard luck—in sixty to eighty per cent of the cases! The shoe is on the other foot. *Not* it seems a sacrilege to be cheerful.

There was a time when given a chance between appendicitis and tuberculosis, a man who loved life would have chosen the latter. Soon after came the time when choice between death from the disease and death from the surgical remedy was, for the appendicitis patient, merely a matter of taste. That time is scarcely a hundred years past; yet, today, there is so little fear of abdominal surgery that a large percentage of the operations are emergency interventions done at the acute stage of the disease; and few are unsuccessful.

I do not know, but I wish and I hope that such a course of development may one day be traced

in thoracic surgery. The technique of thoracic surgery is new and far from perfect. Its results are probably not correctly reflected in the figures since surgery is not yet generally resorted to except in advanced cases. But whatever the results are, they could scarcely be less satisfactory than the medical treatment of open tuberculosis; and I, for one, shall look forward to the development of surgical treatment of tuberculosis receptively, respectfully and reverently. It is not flattering to know that we are living in a dark age with respect to some of our medical treatments, but I shall be glad to stand in the shadow cast from some great new light, if only that light be made to illumine this dark spot in the science of tuberculosis treatment—if only, one of these bright days, a majority of patients with this disease can be cured.

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A surgeon on salary. Must have A-No. 1 training. One willing to do some general practice preferred. Address Box 601, care of this office.

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Position wanted by neat appearing young lady. Was graduated from the University of Minnesota as a medical technician; and is well versed in all laboratory techniques as well as X-ray detail. Excellent references. Eileen Michalik, 2518 University Avenue, N. E., Minneapolis, Gladstone 5302.

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Doctor to locate in town, 400 population. Big territory, live town closest doctor twenty miles. For information write A. C. Nelson, Wales, North Dakota.

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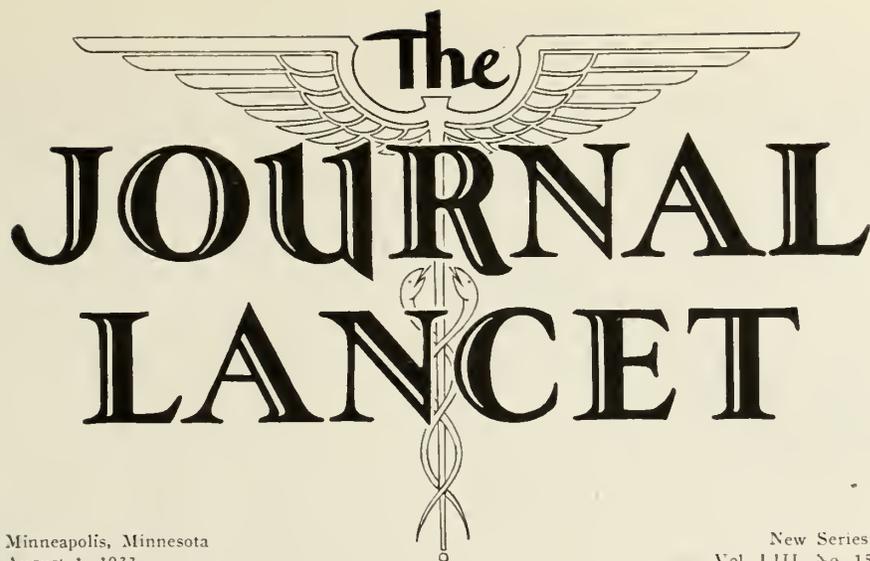
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The
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The Pathogenesis of Pulmonary Tuberculosis*

Henry C. Sweany, M.D.
Chicago, Ill.

NO INFORMED person can attempt to give this kind of a discourse in the short space of time allotted without a feeling of incompetency. The range of this subject is so extensive and in certain respects the details so involved, that adequate exposition should be voluminous in proportions. We must needs resort therefore, to brevity, terseness and the elimination, where possible, of all unnecessary discussion. The most that I shall be able to do is to review briefly the subject for the benefit of the general physician and then emphasize the most recent trends of an old and unsolved problem—the pathogenesis of pulmonary tuberculosis.

As so much of the pathogenesis is set in the epidemiology, infection, immunity, incidence, morbidity, mortality and virulence of the micro-organism, a brief mention of them will afford a clearer introduction to the main subject.

MECHANISM OF INFECTION

Commonly such discussions begin with Koch's discovery of the tubercle bacillus in 1882, but this one should go back to 1866 when Villenin proved the infectiousness of tuberculosis by inoculating animals with tuberculous sputum.

A corollary of the discoveries of Villenin and Koch was to find how the infection takes place. Koch and his pupil Cornet accordingly proposed the "dust" theory that predicated the infection upon the idea that dust laden with tubercle bacilli

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

was breathed into the lung and thereby set up infection. Flugge, in turn, proposed the idea of infection by droplets coughed out by "open" tuberculous patients, and Von Behring proposed his famous theory of childhood infection from drinking contaminated milk. Although today the origin from bovine bacilli is not common, the childhood origin of adult disease is still a common reality. There were many other theories, chief of which is the entry through tonsillar, gastro-intestinal, or other portals, with a secondary passage to the lungs through the lymphatics. Although Aufrecht and particularly Calmette supported this idea, it would seem that Blacklock's¹ recent work rules it out as a major route. The latter's work seemed to point to an aerogenous course directly to the lungs of either dust or droplets laden with tubercle bacilli. The evidence for this is quite conclusive for pulmonary infections, because he found only two bovine stains in 173 definite primary lung lesions in children, while bovine infections in the gastro-intestinal tract were common. In the former the aerogenous route was about the only one possible, while in the latter the ingestion of infected milk seemed to account for the infection without any subsequent lymphogenous route to the lung.

INFECTION INCIDENCE

The infection incidence is shown in Chart I, where percentage has been plotted against age on the most representative curves of tuberculous

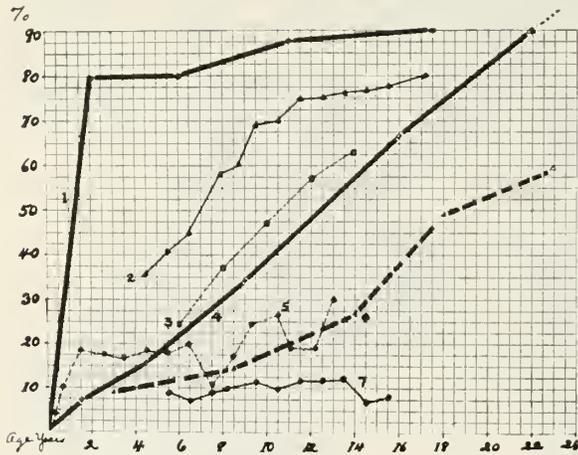


CHART I

Showing various curves of infection per cent for age periods from birth to 24 years (modified from Hart).
 (1) Opie and McPhedran's curve for Philadelphia contacts.
 (2) Hetherington's curve for Philadelphia school children.
 (3) Harrington and Myers' curve for Minneapolis school children.
 (4) Hart's curve for London Hospital patients.
 (5) Taylor's rural Iowa Hospital patients.
 (6) Scheel's rural Norway.
 (7) Slater's rural Minnesota.

infection. This is a rearrangement of some of the recent admirable work of Hart². On the extreme left is Opie and McPhedran's³ curve of contacts, where 80 per cent are infected by two years of age. Next comes Hetherington's⁴ curve for school children of Philadelphia, showing a high curve for a large city, then Harrington and Myers'⁵ for school children of the moderate sized city of Minneapolis. These all fall above the curve of Hart for hospital patients in the city of London, although there is a general parallelism. Hart's curve seems to fall in a happy medium between the urban and rural, and affords a good mean of tuberculization incidence. At the age of puberty it may be seen that only 50 per cent are infected, while the active large city child is 75 per cent tuberculized by the age of puberty. Rural communities are represented by Taylor's⁶ figures for hospital cases in rural Iowa, and Scheel's⁷ for rural Norway, where the incidence barely reaches 25 per cent by puberty. Slater's⁸ figures for rural Minnesota are even much lower.

Other facts presented by Hart were that people in good circumstances were 30-50 per cent less tuberculized than poor classes, and that tuberculization is decreasing. A generation ago most people were infected by the age of puberty, but Lawrason Brown⁹ found that every one is now not tuberculized until the age of 30.

The rate of increase appears to be fairly constant, although Hart speaks of an attacking rate that increases with age—"not in a straight line

but as a rectangular hyperbola." He further says, "This is in keeping with the probable present mode of exposure in London, for the great majority of the urban population make their contacts with tuberculosis outside their homes, and, therefore, with a frequency that increases as they grow up to manhood. The reduction of natural curves to a mathematical basis is, however, admittedly dangerous, and the above interpretation may be fallacious."

RATIO OF MORTALITY TO INFECTION FOR DIFFERENT AGES

By plotting death rates from tuberculosis in the United States against a hypothetical curve of tuberculization incidence, the approximate ratio of mortality to infection for the various age groups is obtained. (Table I.) The result corresponds roughly to that of Dublin and Van Buren¹⁰ for the United States, in 1925. Earlier writers gave a grave prognosis for tuberculosis in infancy, chiefly due no doubt to the fact that the infants they examined already were ill with the fatal disease. These above mentioned findings, however, gave a low figure in all but contact infants, and even these are not as high as formerly thought. Bernard¹¹ in a selected group of contacts under 18 months of age, found only an 8.1 per cent death rate; Myers and Kernkamp¹², 2.5 per cent in a group of essentially symptomless contacts for an observation period of one to nine years. These figures are perhaps slightly lower than the grand average of known contacts, nevertheless the above chart of approximate figures reveals a decreasing death rate of all cases of both known and unknown contacts from 8.0 per cent in the first, to 0.9 per cent in the fifth year of life. In the second five-year period it drops to 0.04 per cent; in the third to 0.03 per cent; in the fourth

TABLE I
INFECTION-MORTALITY INCIDENCE

			Mortal- ity %	Per hundred thou- sand
(a) Known Contact Cases (large dosage)				
Bernard's Contact Cases Under 1½ Years of Age (selected)			8.0	800.
Myers' Contact Cases Under 6 Years of Age with Few Symptoms (selected)			2.5	250.
(b) All Cases (many small doses)				
Estimated figures from the U. S. Census Bureau (1929) of the Registration area on a mean Hypothetical Infection-Incidence Curve.				
	Approx. No. in Millions	Approx. % infected	No. in hundred thousand	Actual Dead of T. B.
Under 1 year ..	2.42	5.	1.2	973
1-2 years	2.27	8.	1.8	1,029
2-3 years	2.24	11.	2.5	625
3-4 years	2.23	14.	3.1	421
4-5 years	2.22	17.	3.7	344
5-9 years	11.00	28.	30.8	1,226
10-14 years ..	11.00	50.	55.2	1,529
15-19 years ..	11.00	72.	78.0	6,464
20-24 years ..	11.00	90.	99.0	12,355

(post-puberty) it rises to 0.08 per cent; and in the fifth (young adult) to 0.13 per cent.

There is no doubt that the last two periods reap the harvest from many earlier infections, but as 30 to 50 per cent infections occur after puberty, there is no argument that can exclude these later infections from setting up disease on their own account, either primarily or as primary sequellar lesions. There is no doubt also that the second year reaps the harvest of many first year infections. According to Kjer-Petersen¹³ the second year infections are about half as fatal as the first, and the third proportionately less than the second.

ATYPICAL PRIMARY INFECTIONS IN ADULTS

My own studies¹⁴ indicate that adult primary infections are not uncommon at present. These observations also indicate that such lesions do not necessarily conform to the usual pathological rules of childhood infections. As W. Blumenberg¹⁵ has pointed out, they seem to be a special type in not presenting the usual lymph node complex. In my reports the lymph node complex was atypical or lacking, yet the local lesion resembled a primary. It may be due to a non-specific allergy or to other factors resulting from modern life that differ from infection in childhood or in adult primitive man.

We may conclude from these observations that apart from reinfection in the adult, there is the problem of the adult primary that must be reckoned with, and this problem will become increasingly more important as more uninfected people reach adult life. The problem now seems to be in both child and adult, first to attempt to cut down the large doses by isolating the careless consumptive, and second, to teach the young and uninfected the necessity of proper personal hygiene and greater care concerning exposure to large doses of tubercle bacilli. Small doses will do proportionately less harm in a well nourished, well rested person.

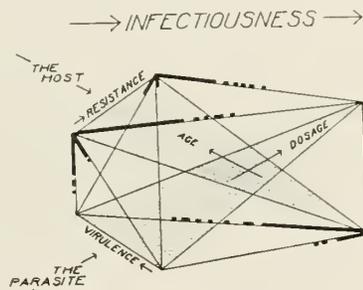
VIRULENCE OF PARASITE

Although few authors speak of it, the virulence of the bacillus is a more important factor than ordinarily recognized. Every laboratory man knows that tubercle bacilli will lose virulence, some rapidly and some slowly on artificial medium. Occasionally a bacillus will be found in human lesions that will not kill guinea pigs. Others will produce more chronic lesions. Blacklock¹ found three avirulent strains from guinea pigs that had been inoculated from the primary lesions of children. The upward limit of virulence, however, is not definite. A few bacilli of some

strains may kill with the same effect as hundreds with another. It must be admitted the bacteriology of tuberculosis, once thought to be a settled question, is still open to controversy.

CONDITION OF THE HOST

The final consideration is that the condition of the host at the time of infection is perhaps linked up vitally with infection, whether primary or secondary. Personal disasters, overwork, disease, malnutrition, all seem to dip down the resistance of the natural barriers to infection. Infection simultaneously with other diseases, or lowered bodily vitality may also be a factor. It certainly has an effect on breaking down older lesions, as was apparent following the influenza epidemic of 1918. There is ever reason to suspect, therefore, that a virulent bacillus, a huge dosage, a weakened host, or all combined, may operate to produce a reinfection from without as well as a primary infection or one from within. I have arranged a chart to show these various possibilities and the relation of host to parasite in the infection. (Chart II.)



A CHART FOR ONE STRAIN OF BACILLI AND ONE TYPE OF HOST

CHART II

A diagram showing the relation of host to parasite and both to the severity of the infection. Active disease is represented by heavy black lines. For example, the lines on the right side of the diagram may be interpreted as follows: A heavy dose of bacilli in an infant is surely fatal (solid black line); a small dose of virulent bacilli will produce a severe disease with many fatalities; while a small dose of a virulent bacilli will produce only a mild or moderate disease.

With this data before us we may be able better to proceed with the details of the pathogenesis or the modus operandi of primary pulmonary tuberculous infection.

PATHOGENESIS OF PRIMARY INFECTIONS

Within the wake of Villenin's work and perhaps stimulated by it, Parrot¹⁶ in 1876, first described the course of childhood tuberculosis and formulated the famous law of "similar adenopathies." This work has been repeated and amended by Küss¹⁷, E. Albrecht¹⁸, H. Albrecht¹⁹, Ghon²⁰, Ranke²¹, Opie²², Schürmann²³, and recently by Armand-Delille and Lestocquoy²⁴ and Blacklock¹. The primary infection

PLATE I

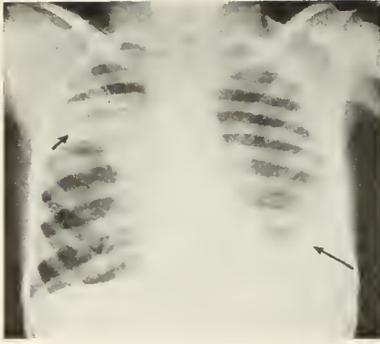


Fig. a. reveals an ante mortem roentgenogram of patient H. T., showing a diffuse shadow at the base of right upper lobe at the hilum and a pleural lesion at the left base.

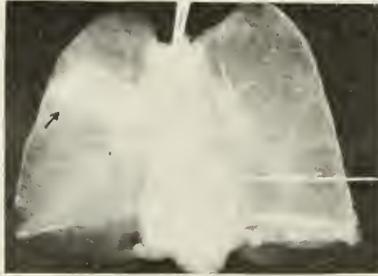


Fig. b. is a post mortem roentgenogram showing the appearance after removal from the body.

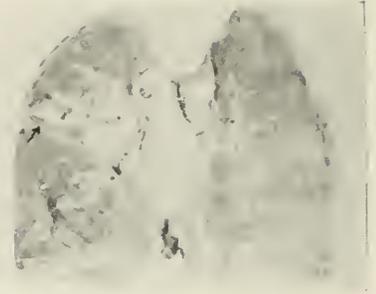


Fig. c. is a photograph of a lateral section showing the large lesion at the base of right upper lobe and the equally large broncho-pulmonary lymph node.

with its pathology and pathogenicity would seem to be well understood if we are to judge by the general agreement of the above mentioned authors.

Without too much detail, I shall outline the principal features of a primary infection. The bacilli are inhaled into the lungs and develop readily, because lung tissue seems to be a suitable medium for their growth. A local alveolitis is first produced varying in size with dosage. The bacilli then seem quickly to pass beyond the lymph barriers into the system, forming an early bacillaemia. The local focus in the meantime becomes a localized bronchopneumonia consisting of monocytes, lymphocytes, fibrin, etc., that subsequently caseates, followed by a progressive enlargement and caseation of the lymph nodes towards the hilum (and the blood stream.) This process just described was what Ranke called the primary complex with the exception that Ranke did not speak of such an early bacillaemia. The bacillaemia, according to Ranke, gradually followed the development of the other lesions and formed various extrapulmonary localizations which he termed the second stage. The organ localizations and chronic evolution of these lesions later, Ranke designated as the tertiary stage. Each stage was thought to have a correspondingly different type of allergic response, so three types of allergy were described to conform to his three stages. Needless to say, Ranke's work has been contested in certain of its phases, but such discussions will not be gone into here. I mention Ranke's work in particular because of the attention it has received in recent years. He is the first completely to describe the pathology of the early primary, as Ghon had formerly described the late lesion.

It seems to me, however, that a more rational grouping may be arranged according to *extent* of

the lesion rather than the age. I have already partially outlined such a theory in a former report (25). Depending on the size of the dosage and the condition of the host, this implantation goes through an evolution that may (1) run its course and heal within a short time, (2) run an irregular course for months or years, or (3) it may proceed rapidly to death. According to these respective degrees of severity, they automatically group themselves into what may be considered first, second and third degree lesions. All appear to have the hematogenous phase or second stage of Ranke, but it is a continuous process and should not be marked off in separate stages. The first degree lesion is considered to be one running principally a regressive course. The lymph node complex and generalization is mild, the bacilli are killed or encapsulated, and the lesion continues on to complete regression which includes caseation, calcification, ossification and ultimately attempted resorption, with no clinical disease at any time. Numerous authors have shown different ages and sizes of the primary lesion including Ranke,²¹ Blacklock,¹ Huebschmann²⁶ and others, but one of the smallest is shown in one of my former reports.²⁷

The second degree lesion is one that becomes clinically active with remissions; the lesion shows a retrogression or alternate progression and regression with the outcome in doubt. There are several forms—the latent lesion that breaks out in apparent quiescence; the continuous local primary; the extensive benign lesions that have been termed epituberculosis by Eliasberg and Neuland;²⁸ and the diffuse type that McPhedran²⁹ speaks of clinically and which may be akin to the "lobitis" in adults, spoken of by Bernard.¹¹ Plates I and II show this type of case, the history of which is as follows:

PLATE II



Fig. a.

Fig. a. The large broncho-pulmonary node shown in Plate I.

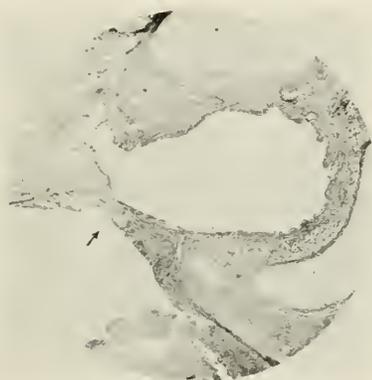


Fig. b.

Fig. b. An enlargement of the bronchus shown inside the circle of Fig. a. Note the thinning of the bronchus indicated by the arrow.

H. T., Case No. 28265, a colored boy, nine years of age. The patient was breast fed, his development was normal. At the age of six he started school, attending regularly until December, 1928, when he became ill. He had measles, mumps, chicken pox and whooping cough, but no operations and no history of tuberculosis. The patient complained of a dull pain at the umbilicus and was taken to the Cook County Hospital, where he remained until June 17, 1929, when he entered the sanitarium. A physical examination revealed the following: General development good, cervical glands palpable, heart normal, and Von Pirquet positive. A chest examination revealed that the excursion was good, the resonance impaired at the left base, the breath sounds were lowered at the left upper and suppressed at the left base, there were no rales or friction rubs, and there was marked bronchial breathing in the right upper. During the course of the disease the patient improved, the pain disappeared from the abdomen, and the lungs became negative. On February 24, 1930, a tonsillectomy was performed. Severe bleeding followed the operation and the patient died from exhaustion and hemor-

rhage on March 1, 1930. The laboratory findings were as follows: Sputum negative for tubercle bacilli, urine negative, and Wassermann and Kahn negative.

Autopsy No. 394 revealed extensive fibro-caseous, slightly calcified lesions in the base of the right upper lung with huge lymph node involvement and pleuritis at the left base.

The third degree lesion is like the first—it runs a definite course but contrariwise it is progressively downward, usually within a year's time. Plate III shows a patient with the following history:

Infant C. K., Case No. 32756, in contact with her mother who was an open case of tuberculosis. The baby was artificially fed, and at two and one-half months of age developed a rash on her body and was sent to the Children's Memorial Hospital, where a Mantoux test was taken which was positive. On August 3, 1931, the patient was transferred to the sanitarium, where a physical examination revealed an emaciated infant with a papular scaly generalized rash on the whole body, areas of dry skin over the chest, tonsils slightly injected, and a discharging left ear. The chest examination revealed the following: Resonance impaired over the left side; breath sounds on the right very loud, rough, wheezing in character; on the left vesicular but less than those on the right. A diagnosis of eczema, otitis media and pulmonary tuberculosis was made. The patient gradually became weaker, dying on August 13th, eight days after admission to the sanitarium.

Autopsy No. 465 revealed an extensive necrotizing infection in the left lower lobe with a lymph node involvement that had ruptured in the bronchus, and terminal generalized tuberculosis.

The incidence of these groups is widely variable, but the greatest individual factor is contact with an open case which is synonymous with large or repeated doses, or both. As we pointed out above, contacts are quickly infected and the prognosis is about ten times as bad as in the haphazard infections which are usually minimal in size and decreased in virulence. Bernard's figures show for contacts under 18 months of age that 8.1 per cent are fatal (third degree lesions); 16 per cent are lingering (second degree lesions), while 75.9 per cent recover without any trace of disease save a tuberculin reaction, (first degree lesions).

A percentage figure of deaths directly from primary lesions is impossible at present, but an upward limit may be approached. From the United States Bureau of Census for 1929 (30) we learn that 86,885 deaths from tuberculosis,

PLATE III



Fig. a.

Fig. a. Ante mortem roentgenogram of patient C. K., showing a dense hilum shadow, a parenchymal infiltration on the right with a small annular shadow on the left indicated by the arrow.



Fig. b.

Fig. b. A roentgenogram of the lung after removal from the body.



Fig. c.

Fig. c. A photograph of a lateral section showing the cavity and a rupture of the main stem bronchus, indicated by the arrow.

12,611 were under 20 years of age. This includes most of the fatal primary lesions (together with many reinfections). An estimate, therefore, of less than 10 per cent of tuberculosis deaths directly from primary lesions will be on the upward limit.

After years of observation, therefore, the incidence, the pathology, the pathogenicity, and the corresponding clinical and X-ray findings of the primary tuberculous lesions are being better understood.

PATHOGENESIS OF REINFECTIONS

Now the question of reinfection is entirely different. It not only constitutes more than 90 per cent of tuberculous mortality, but its mechanism is not well understood. It is commonly agreed that reinfection may be from an earlier primary infection or (the less commonly considered) air borne route. Since the monumental work of Baldwin and Gardner³¹ a decade ago, there have been few new facts added except the results of experiments on animals.

Since the first observation of Koch on the "Koch phenomenon" showing that reinfection was different from the first infection, animal experiments have been legion. Pirquet was responsible for the term "allergy"; Römer revealed the possibilities of vaccination. The many other European workers are too numerous to list in this paper. Krause³², Willis³³, Gardner³⁴, Long³⁵, Lurie³⁶, and others, have contributed some of the more important work in America. Lurie's work reveals the high degree of innocuousness of reinfection in rabbits vaccinated with the human bacillus. The work of Von Behring and Römer³⁷, Smith³⁸, and Calmette³⁹ on cattle vaccination, manifests the pro-

TECTIVE power of a first infection. Human experiments are scarce, but Baumgarten⁴⁰, Klemperer⁴¹ and others have reported limited experiments of inoculation in primarily infected human subject without effect. All available experiments tend to show that an external reinfection is more or less harmless unless huge doses are employed. Furthermore, the inference may be gained that a small dose affords beneficial protection. It was indeed this hypothesis that Calmette developed his B. C. G. vaccine and applied it to human needs. The recent work of Heimbeck⁴² would seem to indicate that it is serviceable in the protection of non-infected adults, irrespective of its value for children exposed to tuberculosis. As Calmette reasoned, it seems better to administer a standard dose of an avirulent bacillus than run the risk of accidental infection with a virulent bacillus in haphazard doses, some of which may be enormous and fatal.

Reinfections are, however, usually complicated by many factors, some of which may vary the result tremendously. The more important are (1) a primary lesion too small to have conferred any of the phenomena of allergy or immunity; (2) a lesion that has completely healed leaving a greatly diluted or negative immunity; (3) a lesion having high degree of allergy with no immunity (Ranke's second stage of allergy); (4) a huge dosage of bacilli; (5) a micro-organism of an unusually high virulence; (6) a depression in the resistance of the host.

The first two (that is in a very small or completely healed lesion) the disease is mostly primary in character, as I have shown in a former report. In such cases the primary infections are so small that there is little change from a

primary type in the reinfection. Heimbeck⁴² has emphasized the tendency to lose allergy in healed lesions of young adults.

The question is, however, do such patients ever return to the status of virgin soil? Or does the tubercle bacillus produce a destructive lesion in such patients? A high degree of allergy without relation to immunity is the chief character of allergy according to Krause³² but is confined only to the "second stage of allergy" by Ranke. It is characterized by rapid inflammation, liquefaction and sloughing without the tendency to fibrogenesis that occurs in the "third stage of allergy" (or in the better protected stage). As much of this is highly speculative, we shall leave it out of this discussion.

The next two conditions—large dose and high virulence—are both possible and probable. Since the prognosis in primary infections, according to Bernard, varies with the age of the child and the size and number of doses, the deaths, therefore, may be attributed to overdosage as much as any other thing. The same rule will no doubt apply as well to reinfections and more particularly where there may be a reduced resistance of the host.

VARIOUS MODES OF REINFECTION

Concerning the mechanism of reinfection, conceptions have changed greatly within the last generation. The old apical lesion, found pathologically by Naegeli⁴³, Orth⁴⁴, and others, was indicted for a long time and no doubt was accused wrongly to a large extent. Such lesions described by Anders⁴⁵ are now known to be over 90 per cent benign. Then came the idea of a lymph node rupture, into a bronchus, (Plate II) first spoken of by Ghon²⁰, then Harbitz⁴⁶, Gekler⁴⁷, and others, which is also a reality, but is surely not the only method and perhaps not the predominant method. There was then the revival of Birch-Hirschfeld's⁴⁸ "tuberculous bronchitis" by Schmorl⁴⁹; the aerogenous origin of infiltrates, spoken of by Assmann⁵⁰, with its application to general conditions by Redeker⁵¹ and Wernecke⁵²; the hilus catarrh of Ranke²¹; Diehl's⁵³ continuous primary; and the fine and course dissemination of Loeschke⁵⁴; and numerous others, showing that authors are not agreed upon any one method. Isolated instances of all these can be found and have been reported. So it seems to be a variable and uncertain mechanism, varying with the individual case.

Recently the hematogenous route has been studied and emphasized by Huebschmann²⁶, and Schürmann²³ from the pathological standpoint,

and by Neuman⁵⁵, Bernard¹¹, and Lydtin⁵⁶ clinically. These authors have shown that such is not only a possibility but must be reckoned with in any scheme of reinfections. This will be mentioned again later in the discourse.

After a due deliberation of all these available facts, therefore, we have chosen to divide the subject of reinfection on the old basis of its internal or external origin, and subdivide the former into bronchiogenic and hematogenous.

TABLE II
PATHOGENESIS OF PULMONARY TUBERCULOSIS

I. PRIMARY	
1.	Regressive
2.	Regressive-Progressive
	A. Latent
	B. Continuation of Primary
	(1) Focal
	(2) Diffuse
3.	Progressive
II. REINFECTION	
1.	Early and Progressive
	A. From Within
	(1) Bronchiogenic
	(a) Apical scar (Anders).
	(b) Coarse and fine dissemination (Loeschke).
	(c) Lymph node rupture (Ghon).
	(d) Endobronchitis (Birsch-Hirschfeld).
	(e) Hilus catarrh (Ranke).
	(f) Continuation of primary (Diehl).
	(2) Hematogenous
	(a) General Miliary (Hematogenous).
	(1) From primary.
	(2) From pulmonary vein.
	(b) Local Miliary (Lymphogenous) Neumann.
	(1) Entire (Lydtin).
	(2) Part.
	(3) Regional (Huebschmann).
	(4) Apical.
	(5) En echelons.
	B. From Without
	(1) Aerogenous
	(a) Direct to lung.
	(b) Bronchial drift.
	(c) Pharyngeal drift.
	C. Interrupted (Both from Without and Within)
2.	Progressive-Regressive
	Mixed Bronchiogenic and Hematogenous, caseous and ulcerative.
3.	Regressive
	Fibro-caseous, fibro-ulcerative, fibrous, calcified.
4.	Complications
	Hemorrhage, pleuritis, emphysema, bronchiectasis.

REINFECTION FROM WITHIN

First, taking up the reinfection from within, we have the bronchiogenic type that may originate from any of the various modes mentioned before. For example, I have several instances where the origin resembled the spread according to Loeschke; I have several where there was a lymph node rupture (Plate II shows the actual act of rupture); several of a continuation of the primary, etc., but I can't show the percentage of each and what happens in the patient who has had an earlier contact and presents a small, apparently healed primary complex, then suddenly or insidiously develops active disease. We have good presumptive evidence from the X-ray, but such evidence is weak without a pathologic confirmation.

There are two sets of facts that have come up within recent years, however, that may ultimately be of aid in the solution of the problem.

One is the demonstration of living tubercle bacilli in calcified lesions and the other is the fact that nature tends rather promptly to destroy her own handiwork of encapsulating tuberculous foci. We have shown (25) in a large series of cases where large primary caseous tubercles were almost entirely broken up by an incutting and resorption of all the encapsulating elements, leaving the caseous mass exposed to the small capillaries from which bacilli could spread to adjacent tissue or be readily picked up and carried back to other parts of the body. This process has not alone been shown in very old foci. It has been found in lesions of adolescent children. (Plate IV, Fig. b.) The bacilli may become quiescent or may go into seclusion long enough to stop the secretion of the usual stimulants that cause tissue reactions. Then, after the capsule is destroyed they become stimulated by the fresh body fluids and cell scavengers, and grow again, perhaps at a moment of stress when the patient can least endure it. The result would be an

extension of the lesion locally, or a migration of the organisms to the lungs where a hematogenous spread may ensue.

The finding of living bacilli in such lesions, of course, is nothing new. Opie²² amongst others, has contributed to this field of work. From our studies we feel that bacilli will live at least five to ten years in a moderate sized "healed" focus where there has been no evidence of clinical tuberculosis. Larger foci may sustain the bacilli longer. Within that same period of time I have noticed almost complete destruction of the capsule at some places along the wall. While we cannot say with finality that this is a source of reinfection, the possibility is great. Some cases that I shall show, reveal that fact that terminal tuberculosis came on in the wake of such destruction of the primary capsule.

G. C., Case No. 28336, a 39 year old American, had syphilis and morphinism for ten years before death. Contact with tuberculosis was unknown. Onset of tuberculosis: Catarrhal three months before death. He was told he had a few "spots" on his lungs. He entered the Municipal Tuberculosis Sanitarium with a rapidly progressive tuberculous broncho-pneumonia, and died.

The autopsy revealed large cavities in both upper lobes and the middle lobe, with tuberculous bronch-pneumonia in the apex of the left lower lobe. The *important feature is a large mass of calcified lymph nodes in the left inferior broncho-pulmonary lymph nodes*, a microscopic section of which is shown in Plate IV, Fig. a. Here the capsules are almost entirely destroyed leaving islands of calcification. It is conceivable that the erosion of the large glandular complex may have liberated enclosed tubercle bacilli that spread either to the adjacent lymph node and later to the lung or directly to the lung to produce the terminal disease. The dissipated life would tend to augment the process. It is not necessary to suspect any external source of bacilli. The large mass of tuberculous nodes along the left main bronchus was enough to furnish the seed. The length of time and the manner are unknown but the total destruction of the capsule is a proven fact.

The history of another case is of of more significance;

D. S., Case No. 25822, a 17 year old girl with a history of several contacts at the age of three years with a family friend dying of galloping consumption. The history after this was uneventful, except childhood diseases, until ten

PLATE IV



Fig. a.

Fig. a. A section of an old large primary complex of patient G. C. Note the destruction of the capsules around the calcified areas.



Fig. b.

Fig. b. A similar section of patient D. S. Note in addition to the destruction of the capsule, the thin rings of bone with the central area of marrow.

months before death (October 20, 1928) when she had "pneumonia and pleurisy with effusion." She was up in six weeks but took cold on Christmas day and had a cough and expectoration. She had another pleurisy attack on January 26, 1929. She went to a hospital where a diagnosis of tuberculosis was made, after which she came to the Municipal Tuberculosis Sanitarium. In August she died and the following pathology was found.

There were four or more distinct ages of the tuberculous lesions, the oldest of which was a "primary complex" on the left side. The lymph node complex is shown in Plate IV, Fig. b, where the capsule is destroyed in places with formation of much bone and marrow tissue containing capillaries that penetrate into the caseous material. The next age of lesion is a cluster of caseous tubercles in the apices and fibroid cavities that are approximately a year in duration. Then there are numerous recently formed cavities towards the base and finally patches of gelatinous pneumonia. The history seemed to be clear and the old large tuberculous complex with a destroyed capsule was compatible with an exacerbation about twelve years after encapsulation.

HEMATOGENOUS REINFECTION

If found valid, this previously mentioned theory will help to explain many of the hematogenous types which will now be taken up.

Huebschmann first called the attention of pathologists to this "localized" bilateral and sometimes even unilateral fine dissemination that may go in waves from apex downwards. Schurmann²³ elaborated upon this theory pathologically, and Neumann⁵⁵, Bernard¹¹ and Lydtin⁵⁶

have studied it clinically. Lydtin recently called attention from the clinicians' point of view to the benign nature of these lesions; that is, loss of weight, anorexia, or mild hemorrhage is all they may present clinically, but the X-ray reveals a fine or coarse nodular dissemination from the apex downwards. Sometimes it involves all of both lungs, sometimes only half of one or both lungs, and sometimes only the apices. In general, the fewer the foci the larger they are. Some may even be of the dimensions of infiltrates in size and character. If the process breaks into a pulmonary vein the result may be a generalized disease; if it filters through the lymphatics it will most likely remain localized in the lungs, as described above, only becoming generalized as a result of a "spilling over" into or a growth into the pulmonary vein, according to classical conceptions.

AEROGENOUS REINFECTION

Although there is not much concrete evidence in its favor, I wish to discuss briefly the aerogenous route. As we pointed out above, however, such an origin is always a strong possibility. Naturally it will always be bronchiogenic. In a study on primary cavities in reinfection tuberculosis with the collaboration of Drs. Kegerreis and Cook⁵⁷, we found that instead of an infraclavicular location of early infiltrates or cavities, as mentioned by Assmann⁵⁰, they nearly all were posterior along certain definite bronchi. In fact, the posterior aspect is striking and suggests that when a reinfection reaches a bronchus in an immunized person, it does not necessarily set up infection in the place in which it localizes, but may be shunted into the more inaccessible bronchi as a result of bronchial activity,

TABLE III

THE RELATION OF PATHOLOGY TO THE X-RAY AND CLINICAL FINDINGS

TYPE	PATHOLOGY		X-RAY	CLINICAL	
Primary	1. Progressive Alveolitis	Progressive { Fibrous Caps { Calcified { Ossified	Progressive Small infiltrate.	Regressive { Fibrous { Calcified (always)	Negative.
	2. Broncho-Pn. Gelatinous-Pn.	"	{ Broncho-Pn. { Pneumonia { Occas. Ulc.	Various	Intermittent attacks and fever.
	3. Caseous-Pn.	"	Pneumonic-Ulcerous		Severe and fatal.
Bronchiogenic	Acinous-nodose. Broncho-Pn. Caseous Pneumonia. Gel. Pn. or Cas.-Ulcerative lesions.	Clearing around edges. Fibrous-angular lesions. Peripheral emphysema. Fibro-cas. Fibro-cal. Fibro-ulc.	"Clover leaf" and "grapelike" clusters. Infiltrates of soft nature. Lobar infiltrates. Annular shadows.	Clearing to angular shape. Encapsulated Calcified (rarely). Healing cavities.	Acute attacks and early clinical tuberculosis.
Hematogenous	Early	Miliary (acinous and interstitial) Nodular. Large nodular to round infiltrate.	Same as under Path.	Clearing becomes indurated, then disappear, later reappear as calcified foci.	Benign type. "insidious onset." Loss of wt., hem. rarely other symptoms.
	Advanced	Thin walled cavities.		Shrunken cavities.	

ciliary action, gravity, or some other cause. We have shown how young adults, even though they may have had a small primary lesion, have many times not sufficient local immunity to prevent the location of the infection like a primary, apparently where it lands. As the local immunity increases, the infection tends to "drift" to the inaccessible or less well cleaned bronchi. Such a theory will explain much and may play a role in all types of reinfection. The same theory will also explain aerogenous infection on the same basis, but like all theories must await confirmation before it can be advocated as a law.

Before closing, a few words must be said regarding the changes in the tubercle bacillus itself. There is a great deal to learn about it before the subject of infection or reinfection can be considered closed. Some forms of the tubercle parasite break up into very small fragments in what appears to be a life cycle. During certain stages of this life cycle there is definite undulating movement of the young forms, suggesting motility. What these will do is still a problem. Until something is more definite, however, we must still look upon aerogenous reinfection as we do the original primary infection which Blacklock has shown to be most likely aerogenous.

PATHOGENESIS OF ADVANCED DISEASE

Finally, we must mention very briefly various pathogenic phenomena that occurs in the usual consumptive constituting the bulk of sanitarium patients. In these patients there is always a mixed process involving many or all of the methods mentioned before.

The spread into large areas of lung tissue by coarse bronchial spread results in the characteristic "acino-nodose" clusters of lesion mentioned by Aschoff⁵⁸. Such lesions are chiefly "proliferative." That is, there is more fibrosis around the acinous lesions. In more moribund patients or in those without resistance or with certain types of bacilli, these lesions become more "exudative" and develop into a localized tuberculous broncho-pneumonia or pneumonia. These lesions frequently extend towards the base in grape-like clusters, as observed a century ago by Carswell. Under certain conditions the lesion may be localized to circumscribed area as either a round or a cloudy infiltrate. Any one or all of these conditions may excavate into cavities and continue on as progressive caseous, ulcerative, ulcero-caseous lesions, or they may result in

hemorrhage, effusion and other complications or distant metastases. On the other hand, the progress may be arrested and regressive changes take place that are represented by fibrosis, calcification, fibro-caseous, fibro-ulcerative and other changes so well recognized in the various forms of healing tuberculosis.

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Tuberculosis of the Joints*

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TUBERCULOSIS of the joints is sufficiently uncommon to explain the relative frequency of errors in diagnosis. Because of the mildness of onset and chronicity of the course of the disease the patient may become reconciled to the gradually increasing discomfort, and the physician may not see him for many months after the initial visit. Many cases are diagnosed as rheumatism, particularly if the patients are adults. Tuberculosis of the joints is always secondary, so the presence of a tuberculous lesion elsewhere in a case of monarticular arthritis, either of child or adult, should put the physician on his guard. In infancy the involvement may be polyarticular.

Tuberculosis occurs in the spine, knee, hip, elbow, ankle, shoulder and wrist in frequency in the order named. Undoubtedly tuberculosis is now less common in America, owing to the extensive and persistent educational campaign waged against it. Even in these times of hardship and suffering among the masses, organizations have seen to it that the children have been supplied with food to form a properly balanced diet. This has never been done before, and there is reason to hope that we shall not see a wave of nutritional disorders, or of tuberculosis, follow this unfortunate period.

SYMPTOMS AND PATHOLOGIC CHANGES

The prominent early symptoms of tuberculous involvement of a joint are pain, which may be described as stiffness, limitation of motion, local heat, swelling and limp, if the involvement is in the lower extremity. As the disease progresses and the cartilage becomes eroded and the bone exposed, the symptoms of pain and stiffness become accentuated. Among children the "night cries" are encountered, the child crying out as the muscles relax when he falls asleep, thus allowing the roughened surfaces of bone to rub on each other. As the muscles again contract and the surfaces of the joint hold firmly together, the pain is relieved and the child on awakening is often unable to tell why he cried out. Adult patients experience "night jerks." As time goes

on and the destruction becomes greater, abscesses may form that will ultimately rupture.

The outstanding feature of a tuberculous joint is its chronicity, and the persistence of symptoms. The patient may say that he has periods when free of symptoms, but on close questioning it will be disclosed that there is always a residual of difficulty even in the remissions. This, in the absence of other involvement of the joint should make one suspect the presence of tuberculosis.

Tuberculous abscesses unmingled with pyogenic organisms cause little if any fever, but on contamination with other organisms either through the blood stream or through surgical drainage they give rise to considerable fever. When the abscesses rupture spontaneously, secondary infection is mild and fever seldom follows.

If the disease is primary in the synovia and if it remains only in the synovia, the symptoms are chiefly those of swelling and stiffness, but when it spreads to the bone the symptoms become more pronounced. If the disease is primary in the bone, as it usually is, the symptoms will depend on the situation of the abscesses, their size, and so forth. They may exist for years with only little discomfort to the patient, but they may enlarge and break into the cavity of the joint, causing the symptoms to become acute. Deformity varies with the structure of the joints, depending on their bony components and the pull of the various muscles. In the spine, flexion is the typical deformity because the disease affects the weight-bearing bodies of the vertebrae and their collapse shifts the weight of the superimposed spine and body anteriorly; the knee in the final stages of the disease is partially flexed, and the tibia is subluxated on the femur owing to the action of the hamstrings, and is rotated externally owing to the action of the biceps femoris muscle; the hip in the late stages assumes flexion and adduction with a tendency for the head of the femur to push upward and backward on the iliac bone, and what has been called "traveling acetabulum" develops.

Roentgenograms reveal the pathologic changes in the bone, but nothing typical that may be ascribed to tuberculosis. Osteoporosis, particularly in the early acute stage, is commonly seen. Rarefied areas indicating the presence of absces-

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ses may be noted. The joint line may be narrowed, but the picture in the more advanced cases is essentially that of destructive arthritis, although attempts at repair are evident. In the knee the intercondylar notch may be markedly accentuated and enlarged, as may occasionally be seen in the elbow when the olecranon process of the ulna wedges deeply between the condyles of the humerus. In the knee rarefied eroded areas may be seen at the margins where the capsule is attached due to action of the tubercle. The roentgenogram depicts to a certain degree the destruction of bone, but when the joint is opened the destruction is usually found to be greater than appeared in the film.

TREATMENT

For many years treatment of tuberculosis of the joints was conservative, as excision had not been attended by successful results.

The time needed for treatment, the expense involved, and finally the uncertainty of permanent arrest or cure of the disease are great drawbacks to conservative treatment, and although occasionally spontaneous cure or permanent arrest of a tuberculous process in a joint may occur with full restoration of function, such occurrence is rare, so rare, in fact, that even the most ardent advocates of conservative measures have been ready to accept ankylosis of the joint as a desired result. If the ankylosis is attained under conservative treatment it is hailed as an accomplishment, without taking into consideration the many years of treatment, either by rest in bed, casts or braces. If the same result can be accomplished in a few months by surgical intervention (arthrodesis) the conservative treatment should be relegated to selected cases. Arthrodesis is being used more and more, even for children. Certain of the joints are more favorable than others for surgical intervention. The knee, hip, shoulder and spine are the joints best suited for arthrodesis; the elbow, wrist and ankle are next in choice. After all, each case deserves separate consideration, because of the many factors involved. In the time at my disposal today I shall consider briefly the treatment of individual joints and the advisability of fusion.

In any line of treatment the fact previously mentioned should be emphasized, that is, tuberculosis of the joints is always secondary to a focus elsewhere. The recognized channels of entry for the bacillus of tuberculosis is either by the air and so through the lungs to the mediastinal lymph nodes, or through food or drink through the intestines and thence into the mesenteric

lymph nodes. Any patient with arthritis should have a thorough general examination, and certainly any patient with monarticular arthritis should be carefully examined for evidence of tuberculosis in the lungs, in the neck, in the abdomen or the genitourinary system. Performing arthrodesis does not permit laxity in the general antituberculous regimen.

THE SPINE

The spine is the most common site of tuberculosis of the joints; the disease is in the bodies of the vertebrae and their joints. The vertebral bodies are deeply placed, and the spinal cord and nerves bar any radical attack from the rear, while the abdomen and the large vessels bar an attack from the front. A safe lateral approach has not as yet been developed, and surgeons have been forced to content themselves with merely reinforcing the posterior portion of the involved vertebrae by aid of bone grafts (Albee) or fusion by a plastic operation (Hibbs). Nevertheless, this more or less conservative attack has been a distinct advance in the treatment of tuberculosis of the spine. After considerable experience with fusion of the posterior portion of the vertebrae over the affected area by either of these methods, I am forced to admit that bony ankylosis with absorption and destruction of the tuberculous areas in the bodies fails to develop in a goodly percentage of the cases. Although many patients are greatly improved they are not permanently free of trouble, as are the majority of patients subjected to a thorough and complete operation for tuberculosis of the knee and hip. Approximately between 50 and 60 per cent of my patients who have been treated by bone grafts for tuberculosis of the spine are free of symptoms; about 20 per cent have died a considerable time after operation, and the remainder have experienced varying degrees of relief. The operation is well worth while, and affords results superior to those following treatment by conservative measures. Owing to the impossibility of focusing the attack on the actual disease, the results do not compare with those following this treatment of the same disease in other situations. For these reasons post-operative support by casts or braces is necessary for a longer period than is the case following arthrodesis of the hip, knee and other joints.

THE KNEE

Tuberculous involvement of the knee is relatively common; in my experience it is more common than in the hip. Under conservative treatment the disease may be arrested and held stationary, but as a rule this does not last and the

disease becomes active again and amputation or arthrodesis will be necessary. Amputation should be reserved for patients with extensive draining sinuses, for debilitated elderly patients, or for those with tuberculosis involving vital organs such as the lungs or both kidneys, who are not expected to recover.

Arthrodesis of the knee is a comparatively simple procedure when compared with the same operation in the hip. The knee is superficially placed and thorough exposure of the joint under a tourniquet permits easy dissection of the tuberculous tissue and careful coaptation of the freshened bony surfaces. The technic varies in different operations. In the Mayo Clinic the operation is performed under a tourniquet. A transverse incision is made, all tuberculous tissue is dissected away, the patella is removed and the ends of bone are sawed off so they will fit together at a flexion angle of about 10 to 15 degrees. A cancellous graft from the end of the femur is placed along the anterior line of contact of the bones. Two wire nails are driven through the tibia upward into the lower end of the femur. The purpose of the nails is to provide fixation while the cast is being applied, and during the period of primary healing. These are removed at the end of three weeks when the cast is split, and the dry, caked dressing is removed. Some surgeons prefer to use a spica cast extending from the toes to the thorax. I find that a well fitting cast extending from the toes to the groin is sufficient, but the leg should be suspended to an overhead frame by weight and pulley. Three or four weeks later, that is, about six weeks after the operation, a new cast is applied and the patient is allowed to be up and about on crutches. In three to four months from the time of operation union is usually sufficiently firm to allow a brace to be substituted for the cast. Often in six months patients can go without support, whereas previous to employing this type of thorough dissection of all tuberculous tissue and the use of the bone graft, a year usually passed before union was strong enough to permit weight-bearing. Occasionally also nonunion ensued and later bone grafting was necessary.

THE HIP JOINT

It is difficult to carry out conservative treatment, for it necessitates wearing cumbersome casts or braces. To provide fixation of the joint, complete recumbency with traction is necessary or, if the patient is to be ambulatory, a spica cast or brace must be worn extending from well up on the thorax to well below the knee, preferably

including the foot. The hip joint is surrounded by heavy, deeply placed muscles. Exposure of the joint is difficult and operation to induce fusion should not be undertaken lightly. In spite of these technical difficulties, arthrodesis is coming more definitely in favor in dealing with tuberculosis of the hip. There are three general types of arthrodesis for the hip.

The intra-articular type of arthrodesis consists of free exposure of the hip joint with thorough removal of the tuberculous tissue and debris, complete removal of all cartilage on the head of the femur and acetabulum, and roughening and shaping of these parts to provide abundant contact of fresh bone so necessary to bring about fusion. This must be followed by careful and prolonged fixation until the roentgen rays show bony union.

Extra-articular arthrodesis has as its object the avoidance of all tuberculous tissue and material, a bone graft being placed to bridge the iliac bone to the trochanter. The graft may be obtained from some other field, as the tibia, when the arthrodesis is of the para extra-articular type, or from the one operative field, such as the wall of the ilium, the anterosuperior spine, or the greater trochanter, when the arthrodesis is of the juxta extra-articular type. The avoidance of tuberculous material is by no means always possible, for in many cases the disease has broken through the capsule and has burrowed into the muscle and fascial planes. The accurate placing of the graft calls for skill that is not possessed by all surgeons.

Combined or mixed arthrodesis is a combination of the intra-articular and extra-articular methods. After complete operation with removal of tuberculous material and the cartilaginous surfaces, as in the intra-articular operation, a bone graft is inserted to bridge the iliac bone to the trochanter, and in addition small bone grafts are packed about the graft to insure contact with the neck of the femur and the acetabular margin. This type of arthrodesis appeals to one as the more ideal surgically. I have obtained more uniformly good results with it than with either of the other types. Careful post-operative fixations as in the other operations, is necessary and must be maintained until bony union is assured.

THE ELBOW

It is sometimes difficult to treat tuberculosis of the elbow. In many instances tuberculosis is a chronic, low-grade disease, and, whereas in the knee with the same amount of destruction present

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Discrepancies in the More Common Public Health Laboratory Examinations*

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THIS paper, written on invitation by the North Dakota Health Officers Association on a "Laboratory Subject," will have served its purpose if it can produce a more personal contact between the physicians and the State Public Health Laboratories, to indicate that constructive criticisms are welcomed by us as a matter of co-operation, and an understanding of why errors and misunderstandings occur in our laboratories.

A simple classification of errors would be those brought about by the physician, and those made by the laboratory. Regarding those made by the physician, they are of two general types, clerical and improperly collected and preserved material submitted for examination. We frequently receive specimens for examination with absolutely no method of identification, no data card filled out and no return address on a container. These specimens are examined and the results held for future reference. A week later we receive a letter asking why, etc., we did not report the examination results. The second type of error, namely improper collection of specimens, is up to the physician to remedy. By judicious reading and questions he can educate himself on this subject. We receive drops of dry blood to examine by the Wassermann test, cultures on Loeffler's medium for Vincent's infection, tubercle bacilli, influenza bacilli and what not; sputums saturated and coagulated by pure phenol, stools and other material preserved with phenol from which a culture is expected, slides with huge drops of pus with another slide superimposed; diphtheria cultures on medium that has the consistency of ivory or has been liquified by proteolytic organisms. Insufficient blood for the Wassermann test is another common mistake. Specimens of water and milk are received through the mails asking for a typhoid examination. A few months ago I received a dog's head from our local army post, examination requested "rabies." An enterprising soldier had emptied his forty-five caliber pistol into the upper portion of the dog's cranium and the brain had the consistency of raspberry jello mixed with splinters of bone. Fortunately, I was able to dissect out a fragment of the hippocampus major and make the examination.

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I am glad to say that the errors made by the physician would not be more than one or two per cent of the total errors.

Laboratory errors, on the other hand, are more common and certainly much more serious. Our public health laboratories examine only specimens associated with or derived from patients supposedly suffering from communicable diseases, to determine the presence or absence of the infectious etiological factor. It is not just the health of the patient to be considered but the health of the general public associated or in contact with him. The state sets up Public Health Laboratories, expects and many times requires physicians to submit a specimen for confirmation of diagnosis or release from quarantine. The physician complies, assuming that the examination will be performed by the most competent personnel available, by the most recent methods and with a minimum of time consistent with accuracy. The laboratory is equipped with scientific instruments of precision, its certified biological stains, chemically pure reagents, electrically operated and controlled equipment, and above all its standardized methods of examinations. The laboratory is a scientific institution yet, sad to say, probably most of you have been morally certain of the etiology of a communicable disease, have sent specimens to the laboratory and receive a negative or a conflicting report, yet a specimen sent to a different laboratory confirmed your original diagnosis. You have split blood specimens and sent them to several different laboratories for a blood Wassermann reaction and have received inconsistent reports, even to the extent of a ++ and a negative on the same blood. Why does this happen, what causes it, and can it be corrected? Errors in public health laboratory examinations are caused by two factors, namely: (1) An inherent biological limitation of accuracy; (2) The personnel of the laboratory.

With regards to the first causative factor of error, our minds are more apt to think in terms of mathematics or inorganic analytical chemistry rather than biochemistry. Mathematical problems have one solution, or a chemical test for a metal or a non-metal is always correct providing the test is carried out under standard conditions. A biochemical examination deals with infinitely

more complex materials, most of which we even do not know the chemical formula. We therefore cannot produce the same degree of accuracy in a biochemical examination as in a chemical one. We know practically nothing about the chemistry of complement, agglutinins, toxins, anti-toxins, amboceptors, etc. A substance derived directly from a living organism will not always behave in strict accord with chemical laws or even our own expectations. Practical illustrations of this will be given in our major lines of work, namely, Bacteriology and Serology.

I BACTERIOLOGY

A. Cultures.

(a) Diphtheria Cultures—The Klebs-Loeffler bacillus will not always grow on perfectly satisfactory medium. I recall a case from a Bismarck physician of this type. The organism refused to grow on numerous cultures, yet in a smear preparation they were plainly visible and the diagnosis was made in this manner. Also, the presence of numerous diphtheria bacilli in the throat does not necessarily indicate a diphtheritic infection. According to Stitt, a two per cent technical error exists under the best of conditions since the *B. xerosis* and pseudo-diphtheria bacilli have almost the same morphology as the *B. diphtheriae*.

(b) Blood Cultures—The germicidal property of the blood may produce an inhibitory effect on the growth of the infectious organism unless a proper dilution with culture medium is secured. The liquid culture medium should be warm at the moment of inoculation.

(c) Stool Cultures—Usually for the typhoid—para typhoid group. These organisms even in an active case may be discharged intermittently and a false negative result. The examination of carriers is much more difficult due to the same reason and a series of specimens should be submitted.

(d) Water—There is only one limitation in the interpretation of a positive report on the colon group. A positive colon finding does not prove that the organism is derived from human beings since colon bacilli are found in all animals. A negative report on a water is usually above suspicion.

(e) Milk—A milk report, mainly the bacteria per c. c., per cent fat, specific gravity, etc., may be accepted as correct.

B. Smears.

(a) Sputums for Tuberculosis—The biological limitations of this test is that tubercle bacilli may be thrown out in the sputum intermittently in cases of ulcerative tuberculosis and not at all in miliary tuberculosis. A decrease in the num-

ber of organisms probably indicates a chronic condition and not necessarily a healing one. The same may be said of tuberculosis of the kidney.

A positive report for acid fast bacilli of proper morphology is usually unquestionable.

(b) Sputums for Pneumococci—There are few biological limitations to smears of this type. In approximately ninety per cent of cases the organism is easily found by a Gram stain. A lancet shaped diplococcus, encapsulated and Gram positive is almost certainly a pneumococcus. The type is definitely established by mouse inoculation.

(c) Pus—Direct microscopic examinations of pus must always be of a presumptive nature. First the number of organisms may be too few to find (it takes about ten thousand bacteria per c. c. to demonstrate their presence). Second, the morphology of many organisms are almost identical, and third, the organisms found may be only secondary invaders. The above reasons speak for the streptococic group, staphylococci, pneumococic, meningococci, gonococci, actinomycosis, etc. Special characteristics of the above are, the meningococcus may undergo autolysis during transit. Negative for any of the above organisms means that none were observed on the slide presented and does not necessarily rule out the disease. A positive report usually clinches the diagnosis.

(d) Vincent's Infection—This condition, caused by the spirochete of Vincent and the *B. fusiformis* is not necessarily present on a positive report since they may be found on the gingiva in unhygienic mouths. A negative report almost invariably rules out this condition.

(e) Chancre—The same limitation exists in finding the *Treponema pallidum* on a slide prepared from chancre serum as of any other organism. A positive report from a supposed chancre of the mouth may be open to error, one from a lesion on the genitals practically diagnostic. I have found the smear method of examination apparently as accurate as the dark field if mercury has not previously been applied to the lesion.

(f) Rabies—Since we have had no cases of rabies in this state, I will not discuss it. It is sufficient to say that in the case of a dog showing symptoms of rabies, it should be quarantined for two weeks and, if death takes place during this interval, the animal's head should be packed in a box of ice and sent to the laboratory.

(g) Malaria—Limitations may be too few organisms in the peripheral circulation, blood smear taken during the chill, or taken after quinine medication. We have had several cases in North Dakota, mostly imported.

II SEROLOGY

Inherent limitations of the accuracy of serological procedures are highly important since several of our most dreaded diseases are practically diagnosed by a study of the patient's serum.

First, the Wassermann technique. No other biochemical or clinical examination approaches the complexity of this test. In the hands of a competent serologist it is the most delicate and accurate test we have for syphilis. The possible biological errors are so numerous that I will not attempt to enumerate them. Off-hand I thought of eighteen possible errors that might be present in the reagents. The test is not one hundred per cent correct in all stages of syphilis. Kilduffe¹ says, in primary syphilis it should show positivity in from ten to twenty days after the appearance of the initial lesion with from 34 to 80 per cent positive up to the fifth week untreated secondary syphilis 96 per cent to 100 per cent, untreated tertiary syphilis 96 per cent, latent syphilis 48 per cent positives. Neuro-syphilis and paresis 96 to 100 per cent. *Tabes dorsalis* 90 per cent, cerebrospinal syphilis nearly 100 per cent. The Kolmer technique is generally acknowledged as the most sensitive test while other than the Kolmer antigen may be less sensitive and give a negative result on a positive blood. A false positive, as Kohmer says, is "inexcusable." The physician should interpret his Wassermann report in the light of the above information and the knowledge of what particular Wassermann technique is being used in the laboratory. Judging from personal experience, I believe conflicting reports on the B. W. R., particularly in the primary and secondary and sometimes in the tertiary stages, are due to faulty reagents or technique, in neurosyphilis the degree of positivity of the B. W. R. or spinal fluid Wassermann may vary considerably in the short period of a month or two especially while the patient is under treatment and even transient false negatives occur. The same can be said of the Kahn test. It seems slightly more sensitive in treated cases but may give false positives.

Second, Agglutination Tests for Typhoid, para A and B and Undulant fever. To my mind, an agglutination test should be just as meticulously set up as a Wassermann test. It is a serological procedure demanding care, accuracy and a full knowledge of its biological limitations by the serologist. An inherent limitation is, the agglutination tests may be negative throughout the course of the disease. In approximately five per cent of typhoid cases the Widal remains negative. Ordinarily the test becomes evident from the tenth

day on. Since the organisms of the typhoid-para typhoid group are closely related, group agglutinins are formed, that is the patient's serum will agglutinate the three types yet being infected by only one type. The practice of reporting the agglutination reaction of the serum on all three organisms is useless and misleading unless an absorption test for each type of organism has been performed or a titration to determine the increase of the agglutinating power of the serum after an interval of a week or two. The organism whose agglutinating titre has increased is the infecting one. The idea back of performing agglutination tests for all three types of organisms of the typhoid group is that the physician may be mistaken in his diagnosis, yet Gilbert and Groesbeck² examined 13,644 sera submitted for typhoid and found only .09 per cent positive for para typhoids. They therefore did not advocate this triple procedure examination. Kilduffe³ reports no para typhoid in 495 sera submitted for a typhoid examination but found many group agglutinins.

Spontaneous agglutination of the cultures, particularly para typhoid B must also be carefully anticipated by the serologist.

A positive agglutination test for *B. melitensis* in a 1 to 160 dilution may be found in normal human serum⁴ and therefore cannot be diagnostic.

I have merely quoted the most obvious biological errors to you. A volume could be written on the subject.

Now to recapitulate at this point. First type of error is due to the physician, the clerical and the improperly collected specimen; the second type due to the laboratory, the first of which is the inherent or, medically speaking, the congenital one, essentially inate to the test itself. The second and last of the laboratory type of error is due to the personnel of the laboratory. Judging from 12 years of experience in the laboratory, I would say that this is by far the most common and absolutely inexcusable. Except in a small office laboratory of the physician, the day of the so-called laboratory technician, that is, a high school student or nurse who took a three or six months' course in a hospital laboratory, is past. The education of a medical technologist or bacteriologist has become much more formal than ten years ago. The American Society of Clinical Pathologists states, "A medical technologist shall signify one who possesses a university degree, etc.—basic sciences, including chemistry, bacteriology, physiology.

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Surgery in Relation to Pediatrics

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St. Paul

BELATED recognition of the fact that the child is not a small adult, but requires entirely independent consideration, has led to the development of pediatrics as a distinct specialty, in the past generation. Application of the same fact to surgery in childhood is often overlooked, and a consideration of a few of the differences prevailing between the child and the adult may well bear repetition from the surgeon's standpoint. The infant and child differ from the adult not merely in size, but, what is more important, in anatomy, physiology and psychology.

Surgical disease in the young child often manifests itself differently than in the adult. Some diseases are peculiar to certain periods of growth and a given disease may present manifestations varying during different stages of the child's development. The activity of growth seems to render the child more likely to be affected by slight causes, making disease sudden in its onset, short in its course, and intense in its symptoms. Cellular changes are more active, nutritional demands are greater, and the organism is less stable than in later life. The unstable nervous system of the child often causes a trifling illness to assume an aspect of the greatest gravity. Disease or injury cause more general reaction, and less tendency to limitation of symptoms to a particular organ or region such as occurs beyond puberty. The younger the child, the greater the tendency for disease to present more constitutional than local expression.

Anatomically, the child differs from the adult in proportion as well as in size. Some of the characteristics of bodily development in early life definitely influence surgical diagnosis and treatment. The abdomen is relatively shorter, but more prominent during infancy than later. The liver is very large in proportion to the abdomen. The omentum is thin and scanty. Fascial development is deficient; the aponeuroses of the abdominal muscles are thin and delicate. The peritoneum is as thick and strong as in the adult. The proportionately larger surface area in infancy and childhood, compared to the mass, give a relatively

larger area of radiation, which affect heat and water regulation correspondingly. The bowel is more mobile, and the mesentery longer, in childhood, than later.

Physiologically, surgical problems pertaining to childhood are affected, to a great degree, by the fact that the metabolism is so easily capable of violent and sudden disturbances. The infant requires much more water per kilo of body weight than the adult, and is very susceptible to disturbances of water balance. Loss of 10% of body water causes serious symptoms, while the loss of 20% is considered fatal. Vomiting, diarrhea, dehydration, and fever are typical results of the local infections in childhood of which otitis media, mastoiditis, and sinusitis are common examples. Dehydration quickly leads to intoxication, and acidosis. Severe vomiting, as in intususception, causes excessive loss of hydrochloric acid and chlorides, and may thus lead to alkalosis. In severe diarrhea there may result an excessive loss of bicarbonate base and of water, leading to acidosis. To overcome these losses, prompt and generous administration of fluids is necessary. Three to five per cent glucose in saline injected subcutaneously or intramuscularly, will often avert disaster. Dependence on oral administration, alone, or on proctoclysis is frequently not justified. Intraperitoneal injection of saline is usually a satisfactory method providing no abdominal pathology exists.

Shock is easily precipitated in childhood, and prolonged or rough surgery, burns, severe loss of blood, starvation, cold, or prolonged pain may be the responsible factors. Children bear these conditions poorly; shock develops quickly, and the ability to recuperate is often meager.

Hemorrhage is borne badly; the proportion of blood to the body weight is 1 to 20, as compared with 1 to 13 in the adult, so that the margin of safety is correspondingly narrower. Undernourished children are particularly susceptible to collapse after surgery, so that whenever possible such procedure should be avoided when the weight is on the decline, or

the general physical condition is poor. Children stand starvation poorly, and lengthy fasting before operation is usually unsafe.

The heart in childhood is relatively strong—its response to short anesthesia is good, but if prolonged it may weaken, with shock resulting. The pulse rate is very variable and undependable in childhood, and therefore is not of much value in diagnosis.

Respiration is chiefly abdominal until nearly puberty. Its rate may be increased by emotion, fever, etc., but the proportion of pulse to respiration is of considerable importance, especially where pneumonia or empyema is a possibility.

Variations in temperature may occur on very slight provocation in early life, and fever is usually high as compared with the adult response. It is noteworthy, however, that some of the abdominal surgical conditions which may cause diagnostic difficulties in early life, are not likely to present abnormally high temperatures. Where such do occur, a general infection, rather, should be suspected, or a pulmonary, renal or cerebral process be sought for. Temperatures should be taken by rectum whenever the oral method is undependable—usually up to about the sixth year.

Any prolonged strain, such as chilling, or excessive pain, lower the resistance of the child to infection, and may be responsible for the development of shock.

If the surgeon is mindful of the narrow limits of safety in pediatric surgery, and is able to maintain normal metabolic conditions, he finds the child very quick to respond, so far as healing is concerned. Injured tissues, fractures, etc., reveal a regenerative tendency superior to that in later life. Bone grafts are less often needed in fractures. Hernias are less complicated in repair, and less often result in recurrence.

Anesthesia is usually well borne by children if not prolonged. Ether is usually preferred in order to obtain proper relaxation. For short anesthesia, Nitrous Oxide or Ethylene serve well. In very small infants, local anesthesia serves satisfactorily, as in pyloric stenosis or intussusception. The "status lymphaticus" type of infant, with an enlarged thymus, deserves considerable care during anesthesia.

The operation, itself, on the child should be made as brief and simple as possible. Gentle handling of tissues is of vital importance. A small abdominal incision is preferable, and

extensive evisceration should be avoided, as cooling of the intestines is not well tolerated. Chilling should be carefully prevented.

Pre-operative treatment is often overdone; purgation is nearly always unnecessary, and may cause a loss of needed tissue fluid. Usually it is advisable to permit water until shortly before the operation. Food should not be withheld under ordinary circumstances for more than a few hours before the operation, as prolonged starvation may initiate an acidosis which may later be difficult to overcome.

Post-operative treatment includes prompt replacement of water, salt, and calories lost as a result of the underlying condition and as an effect of the operation itself. Glucose in normal saline, given subcutaneously, intravenously, or intraperitoneally is of paramount importance frequently. Where shock, anemia, or failure to respond properly, appear post-operatively, transfusion should be done without loss of time, and may often prove a life-saving measure. Food should be given as soon as practicable.

The Konigsberg Surgical clinic has pointed out that the resistance of various age groups to the shock of surgical procedures varies considerably; it is highest from the 11th to the 15th years of life, while during the first year, operative mortality is higher than in any subsequent year until the 60th is reached.

From the standpoint of diagnosis of surgical conditions in childhood, the pediatrician finds most problems of interest concerned with pathology in the abdomen. The determination of the definite existence of those disturbances which call for surgical interference frequently calls for considerable accuracy in history-taking and examination, and for fine precision of judgment. Laparotomy is not to be undertaken lightly in the small child, and the responsibility for advising it is always grave. In the first few months of life such surgery is usually concerned with obstruction. This may be congenital, represented by stenosis or absence of any portion of the gastro-intestinal tract, or may be acquired, as in pyloric stenosis or intussusception. After the second year inflammatory conditions, as appendicitis, assume the leading role.

The inability of the small child to describe his complaint makes necessary a most complete history from the mother. The physical examination is equally important, yet often is unsatisfactory because of the lack of co-

operation by the patient. Effort should be made to make use of every diagnostic procedure before ordering surgery—the casual diagnostician finds in pediatrics unnumbered pitfalls which teach caution and inspire regret. The examiner who dismisses the apparent pain as a mere colic and overlooks a ruptured appendix, has his counterpart in the surgeon who operates for appendicitis where pneumonia was the correct diagnosis. Abdominal examination under general anesthesia is a most valuable aid to diagnosis, but is often neglected. Rectal examination, too, should never be omitted in the possible presence of appendicitis or intussusception.

The routine examination of the urine for sugar, albumin, acetone, and of its sediment by microscope is of vital importance in every case. Pyelitis occurs sufficiently often, associated with severe abdominal pain, to make confusion with appendicitis possible, and the urinalysis quickly dispels all doubt.

The blood examination is likewise indispensable; the presence of anemia suggests at once the need for transfusion preliminary to surgery. Leucocytosis is a valuable index to the vital forces of the organism and affects the prognosis as well as the diagnosis. Excessively high leucocytosis, accompanying an apparent mild appendicitis should suggest the possibility of pneumonia. Leucopenia indicates low resisting power, or an overwhelming infection. On the other hand it may point to the possibility of a general infection, such as influenza, measles, typhoid fever, or mumps, in which leucopenia is a usual occurrence. The significance of the nuclear index as a prognostic aid deserves more attention than is usually given it. This represents the degree to which the body is forced to bring forth immature neutrophils into the peripheral circulation; where this so-called "shift to the left" becomes excessive, very grave prognosis can be made. This may become evident before actual clinical signs of catastrophe appear.

The occurrence of abdominal pain, with vomiting, is usually ominously suggestive of pathology which may require surgical intervention. These symptoms, in childhood especially, are so common that particular caution must be exercised in evaluating their significance. Abdominal pain may accompany the most trivial digestive disturbance or dietary indiscretion. Vomiting is an almost invariable early symptom of most acute infection as well as of gastro-intestinal maladies. When

these complaints assume the dominating part of the clinical picture, however, they deserve most careful consideration.

Numerous conditions occur wherein abdominal pain, with or without vomiting and fever, may suggest the presence of apparent surgical pathology. It must be remembered that localization of pain is inaccurate in the child; it is his tendency to point vaguely toward the mid-abdomen as the site of his discomfort. It is readily influenced by the state of the nervous system, and is greatly affected by suggestion. Hyperesthesia of the abdominal wall is common in nervous children; it also appears in pneumonia, pleurisy, early typhoid, and peritonitis.

Moro describes under the name of "recurring umbilical colic" the not uncommon case in childhood associated with sudden intense pains near or above the umbilicus; constipation, and sudden pallor. Fever and emesis are absent. This may be due to vascular or, more likely, to enteral spasm, and responds to atropine.

"Pseudoperitonitis" refers to the type of peritoneal irritation with abdominal pain, vomiting, and often with marked tenderness, which is not uncommon on lobar pneumonia, influenza, and tonsillitis. This may closely simulate appendicitis, and suggests the advisability of an X-ray examination of the chest whenever doubt arises. The presence of high fever, rapid respiration, high leucocytosis, and cough should always put the surgeon on his guard against pneumonia, despite what may seem an obvious abdominal condition. Surgery performed mistakenly in the presence of an acute general infection is often disastrous.

The two most common occasions necessitating laparotomy in early childhood are intussusception, and acute appendicitis. Although common-place conditions, none the less their diagnosis is not infrequently most difficult. In either case, early recognition of the disease is an enormous advantage to the patient, and the not inconsiderable mortality in both conditions testifies to our failure to establish correct diagnosis promptly.

Appendicitis rarely occurs before the second year of life; its incidence is particularly high between the eighth and 12th years of life. The relatively high mortality associated with it is in part due to the fact that many of the cases in children under the age of two are already ruptured, at operation. Dixon, as well as other observers, has stated that the death rate

among all ages from acute appendicitis is definitely on the increase since 1919. In the United States and Canada, it causes 25,000 deaths annually. Bower has shown that pre-hospital management is the greatest factor in influencing mortality; 80 per cent of the deaths are caused by delay, and the administration of laxatives. A campaign for the purpose of informing the laity as to the dangers associated with delay in diagnosis, and with the indiscriminate use of laxatives in the presence of abdominal pain, was sponsored by the health department and medical and pharmaceutical societies of Philadelphia, with a very definite reduction in mortality from appendicitis resulting.

The appendix in childhood tends to proceed to gangrene and perforation more quickly than in the adult, thus necessitating more prompt diagnosis and treatment. Pain, tenderness and rigidity are the most common symptoms in appendicitis; nausea, vomiting, slight fever and moderate leucocytosis usually occur, though they may be absent even with a gangrenous appendix. Where it lies against the bladder, frequent painful urination may be the most striking complaint. Occasional instances appear where it rests near the obturator foramen, causing pain in the hip which may be easily misinterpreted. The so-called relaxation pain commonly occurs. Rectal examination generally reveals pain and infiltration on the right side and should never be omitted. The abdominal reflex is usually lost over the affected side. The Brittain sign, usually present when gangrenous appendicitis is present, is demonstrated by the operation of the cremasteric reflex when pressure is applied over the right lower quadrant of the abdomen. The poorly developed omentum of the child does not possess the walling off power so well as in later life, thus permitting general peritonitis to develop more easily. Nevertheless, it is the feeling of many, as typified by Bower, of Philadelphia, and Dixon, of the Mayo Clinic, that where perforation has occurred 10 to 12 hours previously, and the symptoms seem limited to the right lower quadrant, that surgical intervention should be delayed for five or six days, until a walled-off abscess has developed. To operate in the presence of a spreading peritonitis, they consider, invites catastrophe.

The problem of whether to operate where the diagnosis is doubtful, is a difficult one. The question as to whether the little patient

is exposed to greater danger when an unnecessary appendectomy is done, than to wait for conclusive proof of the condition, with the all too frequent appendiceal abscess developing in the meantime, is not easily answered. Where the diagnosis is not clear-cut, all other possibilities must be eliminated. Thus a high initial temperature, and a high leucocytosis, are not to be anticipated in the early stages; X-ray studies of the lungs, and careful microscopic examination of the urine should not be omitted. Observation of the temperature, pulse, and respiration hourly, coupled with leucocyte counts at frequent intervals, should be done for six or eight hours when the diagnosis is uncertain, before attempting laparotomy. It should be remembered that such surgery, performed in the presence of influenza, pneumonia, or septicemia often adds shock likely to cause death in a few days.

Chronic appendicitis is rare in early life but is occasionally observed toward puberty. Recurring attacks of pain in the right iliac fossa, with or without emesis or fever, and often induced by exertion, suggest its existence. Occasionally it manifests itself by gastric distress after meals, but the tenderness is usually in the expected location, near McBurney's point.

A condition which readily simulates appendicitis, is that of lymphadenitis in the mesenteric and ileocecal nodes. This may present all of the symptoms supposedly typical of acute appendicitis, as has been pointed out by Brenneman, and by Kennedy. The writer observed a case of a boy who presented acute pain and severe tenderness in the right lower quadrant, vomiting, mild fever and leucocytosis. Three consultants diagnosed acute appendicitis, and laparotomy was promptly performed, disclosing a practically normal appendix, but with markedly enlarged lymph nodes in the adjacent mesentery. These, on section, revealed only a mild inflammation, apparently secondary to a naso-pharyngitis which had occurred shortly before. It should be borne in mind, however, that epidemics of grippe in children are frequently followed by an unusual number of cases of acute appendicitis, and it may not always be possible to differentiate this from mesenteric lymphadenitis.

Intestinal intussusception is most common between six weeks and two years, during which period 75 per cent of cases occur. The

combination of repeated severe paroxymal cramps, with severe vomiting, no fever, increasing shock, and with scanty stools, composed mainly of bloody mucous is recognized as one of the most dangerous conditions that infants undergo. It is important to remember that a mass may not be palpable in the early stages, and diagnosis should be established without waiting for its appearance.

Early recognition has resulted in a decided drop in mortality; whereas in 1911, Ladd reported 31 per cent surgical deaths, Thorndike in 1929 has lowered this to ten per cent. This condition is not uncommon in a mild form which recedes spontaneously, and in some children, it may recur several times. If diagnosed early, non-surgical reduction of the intussusception, by the use of high barium enemas, has been demonstrated under the fluoroscope. This should not be depended upon unless all symptoms immediately subside. Very few diseases so completely depend on the diagnostician's acumen, and few give such gratifying results to treatment, if applied sufficiently early. Where operation has been delayed until gangrene of the bowel has set in, and resection becomes necessary, a fatal outcome is almost invariable. Rodda has pointed out the necessity for inserting retention sutures in the abdominal wall, on closure of the wound, in order to prevent evisceration. This is a not unusual post-operative sequel, in infancy, as the little patient is likely to become very active as soon as the operative shock subsides, and the intra-abdominal pressure may easily break ordinary sutures.

CONCLUSION

1. Treatment of surgical conditions in children requires comprehension of the numerous respects in which they differ from the adult.

2. The unstable metabolism of childhood makes relatively simple conditions likely to become complicated and severe.

3. Acute abdominal conditions in children necessitate prompt diagnosis, immediate treatment, and careful differentiation from the many non-surgical ailments which may simulate appendicitis.

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TUBERCULOSIS OF THE JOINTS

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one would advise arthrodesis, in the elbow one hesitates to advise arthrodesis because weight-bearing does not enter into the problem. The patient may get along with comparative comfort and retain motion. A stiff elbow, particularly with the head of the radius involved, eliminating not only flexion and extension but pronation and supination, is a real handicap. Although it is not considered sound practice as yet, there is a possibility that following arthrodesis of a tuberculous joint, especially in the upper extremity, arthroplasty may be resorted to at a later date to restore motion. I have seen many patients with chronic tuberculosis of the elbow that were getting along so well and with so little discomfort that I considered it inadvisable to attempt any operative procedure.

THE SHOULDER

The same general plan of treatment applies to the shoulder as to the elbow. Considerable involvement is often compatible with fair function, and it may be better to leave well enough alone. The tuberculosis is often of the dry, chronic low grade type, and causes comparatively little discomfort. To wear an apparatus is irksome, and to be effective an apparatus must embrace the thorax, shoulder and elbow, and extend to the hand. As in other tuberculous joints fusion rarely occurs under conservative treatment, arthrodesis, therefore, is a last resort. The old-time resection means a flail shoulder and is not nearly as comfortable or useful as an ankylosed joint at about 65 or 70 degrees abduction and slightly forward. Ankylosis of the shoulder is less of a hindrance than ankylosis of the elbow, so arthrodesis is resorted to relatively more often than in tuberculosis of the elbow.

THE ANKLE

The ankle joint bears the brunt of greater weight-bearing than any other joint. Tuberculosis of the ankle is a serious and troublesome condition to deal with. I have seen a few patients who, after prolonged treatment by conservative measures, finally either obtained ankylosis, or the disease became quiescent enough to permit weight-bearing, but such cases are the exception and not the rule. Sinuses develop, in many cases the

destruction becomes greater as does pain, and finally when the patient, relatives and surgeons are weary and discouraged, amputation at the juncture of the middle and lower third of the leg is best resorted to. I performed arthrodesis in some of my cases. This operation, owing to the anatomic structure of the joint, is not generally satisfactory, either technically or as to results. The preparation of the bony surfaces necessitates removal of all cartilage and this leaves the astragalus fitting loosely into an enlarged joint. In my experience failures have been more frequent after arthrodesis for tuberculosis of the ankle than after a similar procedure on other joints for the same condition. For that reason, particularly in the face of economic stress, amputation is many times the best solution of the problem.

CONCLUSIONS

Tuberculosis of the joints is a serious and disabling condition. Fusion of the affected joints is usually the best that may be hoped for, and as it rarely occurs under conservative treatment, arthrodesis to produce fusion is the method of choice for most of the joints.

DISCREPANCIES IN THE MORE COMMON PUBLIC HEALTH LABORATORY EXAMINATIONS

(Continued from Page 408)

pathology, etc., and with one year's experience under a medical director." If he has specialized in a branch he shall be designated as a bacteriologist, serologist, etc. This is the type of individual to carry out clinical and public health laboratory procedures with accuracy and expediency. Such men as Stitt, Kolmer and Kahn make specific notation that the laboratory procedures must be made by individuals especially trained in the fields of bacteriology, serology, chemistry and histological technique. Who but the trained and experienced bacteriologist will notice the defects in biological reagents before they have arrived at the point where they effect the accuracy of the test, the effects of super-sen-

sitive complement or an antigen that is slowly losing its sensitivity. He must know every limitation of his examinations, both technical and biological. He must note the variations in the purity of chemicals, stains, medium, etc. Accuracy in a laboratory should be placed above all other considerations. A false positive Wassermann or Kahn test or a gonorrheal smear may subject an individual to the most heart-breaking worry or expensive treatment and cloud the rest of their lives with doubt as to their true condition of health; a false positive tuberculosis examination on sputum to an endless anxiety, with the mental fixation of death by tuberculosis, which a succession of negative tests do not remove. A false positive agglutination test is ridiculous rather than serious. I saw a man paying his bill on leaving a hospital cured of a single infection and at the same time a positive Widal on him was received. A false negative diphtheria culture may jeopardize the life of a child and the contacts, a false positive cause needless and expensive treatment; a sensitization of the individual to horse serum, almost unbearable quarantine, and the destruction of valuable material on terminal disinfection. Errors in water examinations and their interpretation, together with too infrequent examinations, may cause wide-spread disease with the resultant misery and death. Careless bacteriological examinations of milk may unjustly take away from the dairyman his main source of income.

In closing I would say of the public health bacteriologist that he must make accuracy the chief aim of his life work; not be just a 3.2 man, but a fourth decimal point man; and just secondary to this, the realization that he is not simply dealing with inanimate specimens, but that through them he is touching the hopes and fears of humanity itself.

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SUBSTITUTION BY PHYSICIAN

That much beloved and highly respected teacher of pharmacy, Dean Wulling, who resembles Admiral Sims in being absolutely unafraid, was once heard to say to a mixed audience of physicians and pharmacists that "although substitution by pharmacists probably occurs, and is deplorable, yet no one is a greater substituter than the physician who dispenses his own medicine."

Well, good medicine is sometimes hard to take and we admire Dr. Wulling for his courage in pouring it out for us even though he knows it's a little nasty. Compliments are nice to hear but criticisms are far more worth while. Doubtless there is much truth in such a statement. It need not be enlarged upon here but furnishes food for thought, and so we pass it on with the good motive that prompted his remarks. Something may be said in defense of a physician's substitution but it is substitution never-the-less.

BALANCED ACTIVITY

Balance in mental and physical activity should receive more attention than it does, not only for the sick, but also for the well. Proper exercise has changed the wry face of many a dyspeptic, and kept the well from becoming soft and stale. There is a large field open to the physician who would act as an advisor of individual activ-

ities. Some over-do, other under-do and the great majority leave it to erratic chance. Reference is not so much intended here to the professional athlete nor the indolent spectator who takes his exercise by proxy, from the grandstand, but to the average man that one meets. Some become interested in a single type of activity neglecting the rest. Others disregard chronological balance and cram their entire year's exercise into a short but strenuous deer hunt for which they are entirely unprepared by any immediate previous training. A third and very important consideration in each case, is the age of the individual concerned.

The physician, at the annual visit, will do well to have this in mind and prescribe a well balanced schedule of activity and rest for both mind and body, and suitable advance training for any anticipated strain. And finally, perhaps it would not be considered indelicate on our part if we admonish the physician himself not to neglect his own setting-up exercises. *homo est.*

PULSE AND TONGUE DOCTOR—AND WHY NOT?

When the insinuating tongue of derision labels some one as a "pulse-and-tongue doctor," it should not be taken as a serious indication of incompetency. The pulse-and-tongue method of diagnosis may be ancient but it is never-the-less

honorable, antiquity having added to its proven respectability.

We do not deprecate the advent of ever increasing methods of precision in mechanical diagnosis; neither do we apologize for the time-honored use of non-mechanical means of clinical observation. Although the contention may be rightfully made that machinery is something modern and up-to-date, it is never-the-less the cart, and should be hitched behind the horse, where it properly belongs, instead of before. As the horse existed long before the cart, so did the observing medical machinery.

Wherever there is a "pulse-and-tongue doctor," whose reputation measures up to the average, there is also to be found a man of native ability, keen perception, and insight, one who recognizes disease by experienced observation, bases his prognosis upon the history of similar cases in the past, and whose therapeutic resourcefulness is usually amazing.

Machinery in medicine is splendid in its place, which is that of an adjunct, but he, who places it first in importance, tends to become a mere assembler of technicians' reports, without which, he is lost; his tactile sense is dulled and his visual perception atrophied. All honor to the well rounded physician who rightfully uses every means at our command in this enlightened age, but no odium should be attached to the appellation of "pulse-and-tongue doctor." His acquaintance may be profitably cultivated.

A. E. 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.

Dr. C. H. Sherman Oakes, N. D., was recently married to Miss Hilla Smith, of Anoka, Minn.

Dr. Klein has moved from Sheldon to McHenry, N. D., where he has opened offices for general practice.

Dr. N. H. Anderson, formerly of Marshalltown, Iowa, has opened offices for general practice at Spring Valley, Minn.

Dr. R. T. Seashore, Minneapolis, has purchased the practice of Dr. Arneson at Starbuck, Minn., and is already located in that city.

Dr. M. J. Fardy, Minot, N. D., has returned from a four months trip abroad where he did special post-graduate work in Vienna and Paris.

Dr. P. B. Jenkins, Waubay, N. D., was appointed to another five year term as superintendent of the North Dakota State Board of Health.

Dr. Henry A. Wheeler, formerly of the Mayo Clinic, Rochester, has decided to locate at Mandam, N. D., and join the Mandam Clinic Staff.

Dr. C. A. Scherer, Duluth, president of the St. Louis County Medical Society, has been appointed health officer of that city for the coming year.

Dr. Nelson Youngs, who recently graduated from the University of Minnesota, has become an associate of Dr. A. D. McCannel, at Minot, N. D.

The members of the Lake Region Medical Society held a picnic at Lakota, N. D., last month, with Dr. H. F. Emert, Sarles, being the principal speaker.

The South Dakota board of medical examiners held their July meeting at Stony Point, Lake Kampeska, with Dr. H. J. Bartron, Watertown, presiding.

Dr. Agnes D. Stucke, Garrison, N. D., has been named as a member of the state public health advisory committee, by the Governor of that state.

Dr. K. Gryttenholm, one of the pioneer physicians who had been in active practice for over forty years at Zumbrota, Minn., died last month after a long illness of heart trouble.

The American Congress of Physical Therapy announces its twelfth annual scientific and clinical session which will be held September 11 to 15, 1933, at the Palmer House, Chicago.

Dr. Fannie Dunn Quain, Bismarek, N. D., was elected a regional director of the Medical Woman's National Association, at the annual meeting held at Milwaukee last month.

Dr. Maysil M. Williams, Bismarek, former director of the division of child hygiene in the state department of public health, took office as North Dakota's first woman state health officer.

Dr. R. C. Radabaugh, Hastings was elected president of the Wabasha County Medical Society, at the June meeting held at Wabasha. Dr. W. F. Wilson, Lake City, will continue as secretary.

Howard, S. D., have secured the services of two young physicians to locate in that city. Drs.

Vollmer and Nelson, recent graduates of Rush Medical School, Chicago, have opened offices for general practice.

Dr. A. C. Strachauer, Minneapolis, was in Seattle last month where he gave a series of lectures and clinics in surgery and cancer in the post-graduate course offered annually by the University of Washington.

No major changes in the administration of the North Dakota Institution for the Feeble Minded, at Grafton, is contemplated by Dr. J. P. Aylesen of Fargo, who has taken over the superintendent's duties as successor to Dr. A. B. Wylie.

Dr. Christian P. Nelson, who was in practice in Minneapolis for over 20 years, died at Owatonna, Minn., his residence during the past few years. Dr. Nelson was a graduate of the Medical School of the University of Minnesota.

A meeting of the Olmsted-Houston-Filmore County Medical society was held at Rochester. Former members of the Dodge County society, which had disbanded previously, have been amalgamated into the society, which will now be known as the Olmsted-Houston-Filmore-Dodge County society.

A regional meeting of physicians and druggists was conducted at Rochester under the direction of the Minnesota State Pharmaceutical Association, the first of a series of regional meetings. The purpose of the meetings is to obtain closer co-operation between the two professions. Other meetings are planned for Austin, Fairmont, Worthington, Tracy and New Uhn.

At the annual meeting of the Montana State Medical Association, held at Anaconda last month, the following officers were elected. Dr. C. E. K. Vidal, president; Dr. B. L. Pampel, president-elect; Dr. W. E. Long, vice-president and Dr. E. G. Balsam, secretary. A fine program was presented and the attendance was the largest since the association was organized. Helena was named for the 1934 meeting.

Dr. C. B. Wright, Minneapolis, who has for years served ably and indefatigably on Committees and in offices of the County and State Societies, has brought honor to them and himself by his election at the Milwaukee meeting to the trusteeship of the American Medical Association, for a term of five years. He is one of nine trustees who conduct the affairs of the organization through the House of Delegates, and is the first Minnesota member to serve on this board.

The Minnesota State Medical Association

broadcasts weekly at 11:30 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint 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 August will be as follows: August 2, "Cardiac Asthma;" August 9, "Cause of Hay Fever;" August 16, "Getting Ready for School;" August 23, "Treatment of Varicose Veins;" August 30, "Tumors of the Prostate."

Ten men and one woman were admitted to the practice of medicine and surgery in North Dakota after examinations by Dr. G. M. Williamson, secretary of the state board of medical examiners. Dr. Maysil M. Williams, Bismarck, is the woman. Other successful candidates are: Durbin T. Yoder, Surrey; Wendell O. Hayhurst, Rolette; Joseph J. Stratte and Charles C. Rand, East Grand Forks, Minn.; Nelson A. Youngs, Minot; Kristin Olafson, Edinburg; Harry A. Wheeler, Rochester, Minn.; Frank A. Remde, Bottineau and Christopher R. Dukart and Earl M. Haugrud, Fargo.

CORRESPONDENCE

Owatonna, Minn.

July 12, 1933.

Gentlemen:

ANOTHER FRAUD

Recently a man calling himself Henry R. Jordan came to my office representing himself to be a representative of the Meredith Publishing Co., Des Moines, Iowa.

Mr. Jordan stated that his firm was offering to farmer subscribers a free accident insurance policy and that he was authorized to appoint in each community one physician and one dentist to whom all persons claiming benefits under this policy would be referred for treatment; that no claims would be paid unless there had been treatment and report by the appointed doctor.

Becoming suspicious of this proposition I wrote the Meredith Publishing Company to inquire whether Mr. Jordan was actually their representative and whether he was authorized to make any such proposition to doctors. The answer to each question was in the negative.

Perhaps by publishing this information there may be a chance of protecting others, and of bringing a dishonest scheme to the point of cessation.

Very truly yours,

C. L. Farabaugh, M.D.

BOOK NOTICE

THE SURGICAL CLINICS OF NORTH AMERICA—February, 1933, Vol. 13, No. 1. Pacific Coast Surgical Association Number. Philadelphia.

The clinic of Dr. Eloesser dealing with "the sites and the types of amputation" is an excellent reminder to anyone contemplating these procedures, particularly from the point of view of obtaining the greatest function out of the remaining member.

"Partial pancreatectomy for hyperinsulinism" as suggested by Emil Holman gives one food for thought in the rare occasion when this condition is seen.

T. M. Joyce in reviewing "Haemolytic Icterus" gives a few suggestions on the differential diagnosis by laboratory methods.

With regard to "Major Surgery in People of Advanced Age" Charles D. Lockwood suggests the importance of not overlooking surgical therapy where it indicated regardless of the advanced age of the individual.

An interesting case of osteochondroma of the ileum was presented by Wayland A. Morrison. The stimulating effects of X-ray therapy upon the growth of the tumor suggests that this type of therapy is definitely contraindicated and emphasizes the point that surgical intervention is the procedure to be recommended.

The other clinics presented in this volume were on the whole well presented but were of such common occurrence as to necessitate no special comment in an abstract of this nature.

C. O. RICE, M. D.

THE SURGICAL CLINICS OF NORTH AMERICA—April, 1933, Vol. 13, No. 2. New York Number. Philadelphia, W. B. Saunders Co., 1933.

The clinic of Dr. Edwin Beer was a pleasant review of the subject of bladder tumors.

A list of "unusual gynecological conditions" was presented by Dr. Robert Frank. These should be of interest to anyone in the field of gynecological surgery.

Dr. John M. Hanford presented an illuminating clinic dealing with the surgical treatment of tuberculosis lymph nodes of the neck. In view of the fact that he had previously reported a similar series of cases which had been treated with X-ray it was interesting to note that his results from surgical excision were better than those obtained with X-ray therapy. He mentions that the majority of cases were not suitable for excision on account of local and general causes. The early cases were found to be the most amenable to cure by excision. A definite complication of this type of therapy was the occurrence of occasional slight defects such as paralysis of the lower lip or of the trapezius muscles, etc.

An interesting association between breast pain and gynecological pathology was reported by Howard C. Taylor.

The remaining papers dealt with various types of malignancy and were interesting from their own point of view but presented no exceptionally unusual features which should require abstracting here.

C. O. RICE, M. D.

THE SURGICAL CLINICS OF NORTH AMERICA—June, 1933, Vol. 13, No. 3. Lahey Clinic Number, Boston, Mass. Philadelphia. W. B. Saunders Co., 1933.

Regional ileitis has recently been more frequently recognized as a clinical entity largely because of its more accurate diagnosis with the aid of the X-ray. Howard M. Clute has discussed this condition very clearly and suggests a short circuiting anastomosis from the ileum to the transverse colon as the surgical procedure of choice.

A group of clinics dealing with carcinoma of the colon and rectum presented by Sara Jordan and Richard B. Catell represented a good review of the clinical features and operative maneuvers encountered in this condition.

In the series of lectures dealing with biliary disease Howard M. Clute illustrated the importance of not despairing of giving repeated transfusions when it was indicated. After having given up hope for the life of one of their patients who had suffered repeated hemorrhages due to an obstructive jaundice, four transfusions of 500 cc. of blood were given within a period of twenty-four hours resulting in eventual cure of the patient.

The venoclysis described by Frank B. Ramsey is worth the consideration of every surgeon who finds it occasionally necessary to administer intravenous fluids to his more serious patients.

Dilaudid for intractable pain as recommended by O. J. Menord should be worth consideration for patients who require narcotics over a long period of time. The cancer patient should be especially grateful for this comparatively new drug.

The cholesterol determination of the blood as a laboratory method aiding in the differential diagnosis of hyperthyroid disease from other closely allied nonhyperthyroid conditions, as described by Lewis M. Hurxthall appears to be a very excellent method, which should aid in clearing up many of those border line cases and will probably aid in eliminating many cases of functional neurosis from surgery.

There were many other interesting and extremely instructive papers in this volume which should be reviewed by those interested in that field.

C. O. RICE, M. D.

ADVERTISERS' ANNOUNCEMENTS

OFFICE FURNITURE

The W. D. Allison Co., Indianapolis, Ind., have added quite a few popular priced pieces to their line of fine physicians' furniture. If you haven't seen supplements to their catalog, illustrating and describing these new pieces, they will be glad to furnish them upon request.

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FROM A LILLY BULLETIN

"The benefits derived from the use of local medicinal agents commonly prescribed in nasal therapy would appear to depend to a considerable extent upon the manner in which they are applied. Some physicians recommend the use of sprays, while other favor drops. Linn has called attention to the value of double spraying; the first shrinks the exterior turbinate, allowing the second spraying to reach more readily the important middle turbinate area. According to Jackson and Coates, gravity will carry further into the recesses of the nose and sinuses than a spray or applicator. In applying drops by the gravity, or postural, method, the patient lies on a couch or table with the head well down over the end. The drops, usually about ten, are instilled into each nostril. The head is then rolled from side to side. After two or three minutes a normal recumbent position is resumed and should be maintained for from three to five minutes. During this procedure the patient is instructed to breathe through the mouth and not to 'sniff.' Gentle tapping over the forehead may facilitate the spread and penetration of the drops."

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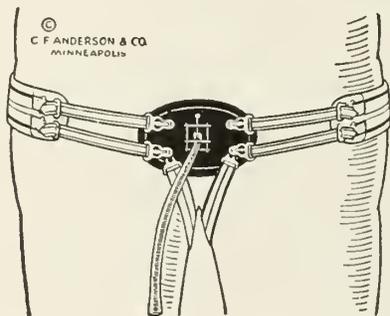
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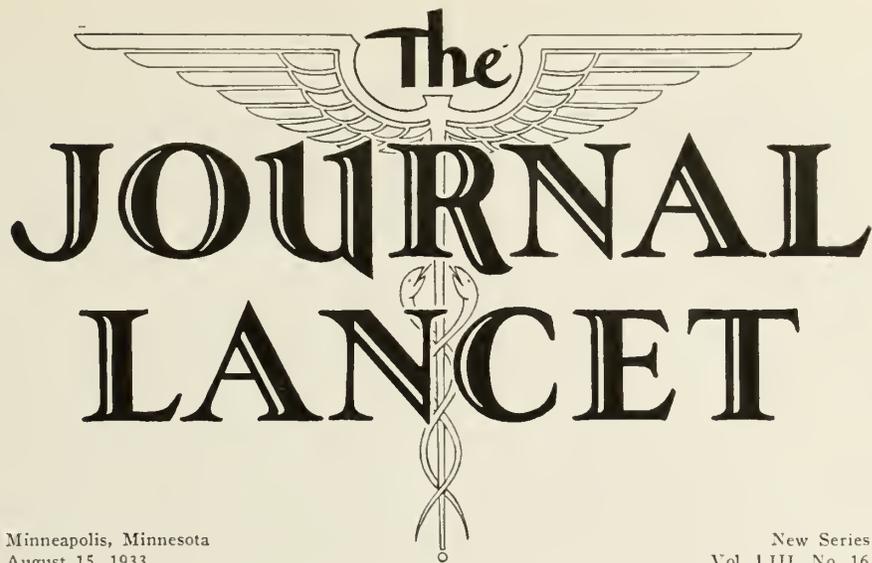
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The JOURNAL LANCET

Minneapolis, Minnesota
August 15, 1933

New Series
Vol. LIII, No. 16

TRANSACTIONS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION, 1933

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(Not yet elected.)

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PROCEEDINGS OF THE HOUSE OF
DELEGATES OF THE
FORTY-SIXTH ANNUAL SESSION OF
THE NORTH DAKOTA STATE
MEDICAL ASSOCIATION

WEDNESDAY, MAY 31, 1933

The first meeting of the House of Delegates was held at the Masonic Temple, Valley City, North Dakota, and was called to order at 3:00 p. m. by the President, Dr. Paul H. Burton, Fargo.

ROLL CALL

Secretary Skelsey called the roll and the following Delegates, Councilors and Officers responded:

Drs. Frank I. Darrow, Fargo; O. A. Arneson, MacVile; R. W. Pence, Minot; A. R. Sorenson, Minot; C. J. Meredith, Valley City; M. D. Westley, Cooperstown; O. T. Benson, Glen Ullin; H. A. Brandes, Bismarck; J. G. Sherman, Oakes; A. P. Nachtwey, Dickinson; N. W. Schunacher, Hettinger; T. L. DePuy, Jamestown; Syver Vinje, Hillsboro; D. W. Matthaei, Fessenden; Murdock McGregor, Fargo; G. F. Drew, Devils Lake; George M. Williamson, Grand Forks; E. M. Ransom, Minot; F. L. Wicks, Valley City; N. Oliver Ramstad, Bismarck; P. G. Arzt, Jamestown; L. B. Greene, Edgeley; J. J. Seibel, Harvey; A. E. Spear, Dickinson; W. W. Wood, Jamestown; C. E. Stackhouse, Bismarck; A. D. McCannel, Minot; President Burton 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-fifth Annual Session as published in THE JOURNAL-LANCET, July 15, 1932, be adopted, and 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:

Paid up membership as of date May 29, 1933, three hundred and twenty (320) physicians. This represents actual cash receipts from current annual dues. There are other men who are certified to by local societies as having paid, but whose money is temporarily tied up in banks not yet fully recovered from the effects of the so-called National Bank Holiday put into effect

several months ago. These frozen assets will doubtless be liquidated soon, and upon receipt of the Society's cash our total will be increased. During the past year our total membership reached three hundred and ninety (390). Upon a separate sheet I give in detail the various remittances that have come in since our last annual meeting.

The nation-wide depression of the past three or four years was especially severe the past eighteen months. For the benefit of the later historians of medical practice in North Dakota, the most of you can truthfully put yourselves upon record as having gone through the heaviest financial calamity of your existence. The Federal government, the States, and the Local communities have all been heavily burdened with the expenses of caring for the millions of the unemployed and the indigent—hence the heavy tax burdens will fall upon many who right now are so crippled financially that they are liable to lose what little they may have acquired in the formerly better years. Probably every one of you has personal knowledge and disagreeable experiences of the physicians' precarious career during these later years.

FEDERAL AND STATE APPROPRIATIONS FOR THE
VETERANS' BUREAU

The attitude of the medical profession has for some time been definitely set as regards this subject. Within the space of a few months, as compared with the several years' control by the Veterans' Bureau and its allies of very large expenditures, the Federal government now has reduced radically the money allotments and the other benefits formerly accorded to the veterans, but more especially as concerns the non-disabled men. In this reform movement there has been the backing not only of the major portion of the present Congress, the Economic League, and the American Medical Association, but also by some of the men prominent in the American Legion. Of course, the danger in sweeping reductions of this nature is that there may be some temporary injustice inflicted upon the really deserving and disabled veterans, but this perhaps could be remedied within a reasonable time.

CONTRACT PRACTICE—STATE AND NATIONAL
MEDICINE

On invitation of the American Medical Association, I attended, at its expense, the November, 1932, meeting of the national secretaries and of the officers of the American Medical Association. With the exception of one other title, all of the papers and of the discussions centered upon

Contract Practice, or, as one essayist termed it, the octopus of the medical profession. Much oratory and quite a variety of opinions. Some urged that the parent organization, the A. M. A. headquarters, should take the initiative and a firm stand against the various methods of contract practice. The officials of the A. M. A. replied that all action must begin with the lower unit, and then, as necessity required, bring action and pressure first through the State and then finally through the A. M. A. headquarters. There was cited the protest from Texas, where the Dallas County Medical Society had brought charges against one of the Dallas clinics for alleged secret and subversive contracts with corporations, etc., and suspended that clinic. Appeal made to the State Association and then to the Judicial Council of the A. M. A., all of which sustained the Dallas County Medical Society. It is now claimed that the clinic in question has agreed to accept the decision, to cancel the contracts, and to apply for readmission to that county medical society. I notified the secretaries of our local societies that all the papers and full discussions could be found in the A. M. A. Bulletins beginning with October, 1932, and for several months thereafter. Also in the A. M. A. Journal, in a number of issues during the past winter, there were a number of articles detailing various methods of hospital, insurance, and strictly commercial contract practice. Beginning with the May 20, 1933, issue Journal A. M. A., may be found contributions upon the subject of private group practice.

From another State journal I extract the following interesting data:

"An Amendment to the Dallas (Texas) County Medical Society, upheld by the Texas State Medical Association and by the Judicial Council of the American Medical Association:

"No member or combination of members shall either directly or indirectly enter into contracts or agreements to render professional service under the system known as Contract Practice except in situations wherein the needed medical and surgical services cannot otherwise be obtained. (As, for instance, railroad surgeons, physicians in mining camps, lumber camps, instances to meet necessities of patients to be served.)

"Any member or members entering into contract with individuals, corporations or other concerns to provide medical and surgical services for groups of individuals, or individual groups, to cover a period of time, for stipulated remuneration shall be in violation of this regulation and

subject to the penalty otherwise provided for unethical conduct.'"—(From "Progress" of Montana, April 28, 1933.)

The legality of corporations to practice medicine and surgery, etc., continues to be questioned. Corporations try to dodge the issue by claiming that the practice of medicine and of healing is done by licensed and reputable physicians and dentists under contract with said corporations.

THE COST AND PROBLEM OF MEDICAL CARE, AS STUDIED BY THE FIVE-YEAR COMMITTEE

This extremely expensive survey, taking fully five years, and affording some salaried positions to those gladly accepting the jobs, was completed the past year. In addition to the many pamphlets and the books costing as high as \$4.00 per copy, were the Majority and Minority Reports, the publication of which Reports caused excitement enough to resemble hysteria. A digest of the two Reports has been published by the University of Chicago, price \$1.50. Quite naturally, the bulk of the medical profession will follow the arguments and the advice set forth by the American Medical Association and its official Journal, the gist of which is that all of our physicians must endeavor to retain control of the practice of medicine, avoiding lay and commercial interference and attempted dictation.

The Secretary of the Michigan State Medical Association writes me that after about twenty months of thorough survey by Michigan Health and Medical Agencies, the State Association has personally prepared and will have ready by June a Report of about 250 pages of really accurate data. Price \$2.50.

Dr. Paul H. Burton, our State President, during the past winter attended the Northwestern Regional Conference held in St. Paul, which included nearby states and representatives from the A. M. A., etc. Theme: The Majority and the Minority Reports on Cost of Medical Care.

In Fargo, on December 2nd, 1932, was held a meeting of as many of the officers and councillors as could attend. Also present were members of the Committee on Public Policy. Matters affecting the welfare of the profession were discussed. At that meeting also was passed the following resolutions, copies of which were sent to secretaries of our local societies, and one to THE JOURNAL-LANCET for publication therein:

"The Councillors go on record that they are absolutely opposed to that type of so-called contract practice covering sickness insurance where the agents solicit membership from the public, yet where no previous medical examinations have

been made, nor where the requirements for membership in such sick benefit societies do not require a properly approved medical examination as necessary for such membership."

Unusually good health conditions throughout the nation are reported by the U. S. Public Health Service and also by the statistical department of the Metropolitan Life Insurance Co., which latter has an immense amount of insurance placed in the industrial world, and which keeps close watch upon the health of its policyholders. Milwaukee, during 1932, had the most healthful year in its entire history; general death rate there 8.8.

But cancer, diabetes, and heart disease are charged with more deaths than ever before. Suicides are on the increase. Some of the insurance companies attribute this to the past few years of extreme economic depression, and also call attention to the fact that a number of those suicides, found otherwise financially bankrupt, were heavily insured in favor of their families.

In Canada, as well as in the United States, 1932 was a record health year. In Canada, out of one and one-quarter millions of industrials insured in the Metropolitan Life, the death rate in 1932 declined to 7.7 per thousand insured lives—a drop of 4.3% from the previous minimum of 1931.

The Health Organization of the League of Nations reports death rates and sickness have been lower than for years.

So far as our own country is concerned, we know that the various welfare organizations, Federal, State and Local units, have afforded to millions of the poor people, of which a certain percentage were really deserving, good, substantial food, fuel, clothing, medical care, and free housing; as a matter of fact, we may accurately claim that many thousands of these wards of the country at large have fared better than in any other period of their lives.

During January and February, 1933, our State Legislature was in session. Concerning medical affairs affecting our profession, your Committee on Public Policy will make due report.

The A. M. A. request that I call your attention to the recently printed book of 1300 pages entitled Abstracts of Medicolegal Cases. This is a compilation of the various abstracts published in the Journal A. M. A. weekly, and has been published at the suggestion of the National House of Delegates at the New Orleans meeting last year.

ALBERT W. SKELSEY, State Secretary.

President Burton congratulated Dr. Skelsey on his report and expressed his appreciation of his interest in the affairs of the Society.

Dr. Frank I. Darrow moved that the report be referred to the Auditing Committee.

The motion was seconded and unanimously carried.

REPORT OF CHAIRMAN OF COUNCIL

Dr. E. M. Ransom stated that the report of the Council appeared in the July 15, 1932, issue of THE JOURNAL-LANCET and there had been no action since that time. He moved that the report be accepted as published.

The motion was seconded and unanimously carried.

REPORT OF TREASURER

Dr. W. W. Wood presented the annual report of the Treasurer, which was referred to the Auditing Committee.

APPOINTMENT OF AUDITING COMMITTEE

President Burton appointed the following as an Auditing Committee: Dr. N. Oliver Ramstad, Bismarck; Dr. L. B. Greene, Edgeley, and Dr. A. E. Spear, Dickinson.

REPORTS OF COUNCILORS

FIRST DISTRICT

The Cass County Medical Society had six meetings during the year besides a joint meeting in which they were the guests of the Fargo-Moorhead Retail Druggist Association. Ten local members appeared on the programs and one guest speaker. The average attendance at the meetings was thirty-three. Two members of other societies in the state were elected to membership in the Cass County Medical Society during the year.

Total paid up members for the past year were sixty, with one associate member. Total members paid up by May 31, 1933, forty-six.

Respectfully submitted,

(Signed) MURDOCK MACGREGOR, M.D., Councilor.

SECOND DISTRICT

The Devils Lake District Medical Society have had three very interesting and well attended meetings during the year. We have not had any outside talent. We find it very practical to have a luncheon just before the meeting and each member pays for his own meal which prevents the depletion of our finances.

Respectfully submitted,

(Signed) G. F. DREW, M.D., Councilor.

THIRD DISTRICT

The Secretary of the Grand Forks District Medical Society reports to me that the Society has sixty-three regular members, two associate members and one honorary member.

There are seventy-two men practicing in this District—three of that number are members of societies

more convenient for them to attend, leaving but six non-members. Meetings are held each month from September to May; all have been well attended. One meeting was devoted to discussion of economic problems pertaining to medical practice; and the December meeting, to which the Legislators were invited, was given over to the discussion of medical legislative problems. I would advise that the December meeting preceding each legislative session be devoted to discussion of proposed legislation and invite the legislators to attend. The meeting we held was very satisfactory.

Conditions over which we had no control embarrassed our Secretary in getting his report promptly—but it will all work out satisfactorily.

Our Society is well officered and prospering.

Respectfully submitted,

(Signed) GEORGE M. WILLIAMSON, M.D., Councilor.

FOURTH DISTRICT

The report for the Fourth District covers the activities of the Northwestern District Medical Society for the year beginning June 1, 1932, and ending June 1, 1933.

We have forty-six members in good standing; fourteen have been suspended for non-payment of dues; one has moved away; we have three new members. We have had twelve meetings, with an average attendance of twenty. There have been no deaths.

During the year a number of interesting papers were read, and several moving picture films of various subjects of interest in medicine and surgery were shown. A definite program for each meeting was prepared, and much less difficulty was experienced this year than formerly in getting members to take part in these programs. This has added greatly to the interest and made it worthwhile for physicians to come in from outlying towns. These men have a right to expect worthwhile programs, and will no doubt attend district meetings in larger numbers if they know that they will be repaid for the sacrifice in time and money, which they must make in order to be present at these meetings.

For a number of years the hospitals have furnished the meeting place and provided meals without cost to those in attendance, but because of the depression the physicians during this past year have paid for their meals at the rate of fifty cents per plate.

In January we elected officers for the ensuing year as follows: President, Dr. A. R. Sorenson; Vice-President, Dr. F. K. Kolb; Secretary-Treasurer, Dr. J. R. Pence; Delegates to State Meeting, Dr. R. W. Pence and Dr. A. R. Sorenson; Alternates, Dr. H. G. Grieve and Dr. H. O. Grangaard; Censors, Dr. R. W. Pence, Dr. F. E. Wheelon and Dr. Paul H. Rowe.

Respectfully submitted,

(Signed) E. M. RANSOM, M.D., Councilor.

FIFTH DISTRICT

The present membership of the Sheyenne Valley Society is fourteen.

We have lost by death, since our last meeting, three valued and respected men—Dr. Paul M. Kellogg of

Rogers; Dr. Earle B. Crosby, Valley City, and Dr. E. A. LeBien, McHenry.

We have two eligible doctors in our territory who are not members at present.

Our Society has met four times in regular scientific session with reports of cases and medical subjects discussed.

Several meetings were held regarding the State Medical Society.

Our officers are: President, Dr. C. J. Meredith; Vice-President, Dr. William Campbell; Secretary-Treasurer, Dr. W. H. Moore; Delegate, Dr. C. J. Meredith; Alternate, Dr. S. A. Zimmerman, all of Valley City.

Through the courtesy of Dr. Syver Vinje the following data of the Traill-Steele District Medical Society are submitted:

The officers are: President, O. A. Knutson, Buxton; Vice-President, Dr. Bernt Odegaard, Mayville; Secretary-Treasurer, Dr. Syver Vinje, Hillsboro; Delegate, Dr. Odegaard; Alternate, Dr. Vinje.

There are ten members in good standing; one removal from the district. There are three eligible doctors in the district, two being new arrivals. There were three regular meetings, with an average attendance of seven visitors. A very good fraternal spirit prevails in this Society.

Respectfully submitted,

(Signed) F. L. WICKS, M.D., Councilor.

SIXTH DISTRICT

We have in good standing fifty-two members; four of these are new members—Dr. L. B. Moyer of Elgin; Dr. Maude M. Gerdes of Zealand; Dr. Robert Hallenberg of Bismarck, and Dr. Daniel T. Weston of Mandan. Only two members have not paid their 1933 dues.

One member, Dr. William P. Thelan of Wilton, has retired because of ill health. Dr. J. H. Hoskins has transferred his membership to Wahpeton. There have been no deaths among our members.

There have been four regular meetings of the Society held within the past year. The average attendance has been thirty-two, exclusive of guests and visitors.

In addition to papers and demonstrations by the local members, we have had four guest speakers who have added much to the interest and value of our programs. They were: Dr. Arthur W. Ide of St. Paul, Minnesota; Dr. E. C. Stucke, Garrison, North Dakota; Dr. J. A. Meyer of Minneapolis, Minnesota, and Dr. D. A. Stewart of Nanette, Manitoba.

Our officers have given freely of their time and effort in promoting the Society's welfare and they deserve much credit for their good work.

Two innovations in our programs have proven helpful. Three members are selected alphabetically to present case reports during each meeting. This encourages all members to take an active part in the programs. Two motion pictures were used, one dealing with cancer of the skin, and the other with management of breech presentation. They were well received and were highly instructive.

The economic stringency has made it difficult for the doctors in our district, but they are still carrying on, doing everything they can for the sick and injured. The activities of a number of short-lived local mutual health insurance societies have been somewhat disturbing. They have attempted to reduce arbitrarily the doctors' fees, but they have thus far received but little support from the public or the physicians.

The year has been a satisfactory one professionally and the spirit of our members is as high as ever in spite of the increased economic difficulty.

Respectfully submitted,

(Signed) N. O. RAMSTAD, M.D., Councilor.

SEVENTH DISTRICT

I have the honor to report Stutsman County District has had a very successful year.

There have been three major meetings. September 21, 1932, Dr. E. J. Kepler, Rochester, Minn., was the guest speaker and he presented a very entertaining and enlightening subject.

The second meeting was held on December 19, 1932, which was a joint meeting with the dentists of this district. We had the pleasure of having Dr. Paul H. Burton presenting the subject of particular interest, that of state or social medicine. There was a rather full attendance at this meeting and from the discussion the interest of the profession was very apparent.

On March 21, 1933, Dr. W. H. Long, Fargo, presented a paper on anemias, which was much appreciated by all in attendance.

These meetings have all been well attended, indicating a rather active interest of the affairs of the Society and medicine in general.

We have twenty active members at the present time. We lost one member, Dr. J. R. Ostfield, who has moved to Fargo.

The members have at all times co-operated in every way with the Councilor to put over any project that was contemplated.

Respectfully submitted,

(Signed) P. G. ARZT, M.D., Councilor.

EIGHTH DISTRICT

The Southern District Medical Society has held three meetings during the past year. Fairly well attended, considering the scattered membership of the Society. Main subject of discussion at each meeting has been the steady increase of poor relief work and the tendency on the part of the County Commissioners of the several counties comprising the district to scale down their rates of compensation allowed in these cases. Attempts to get doctors to submit bids for doing this work have been made in some instances with the idea expressed of sending the work to the man who would do it the cheapest. However, so far, medical society members apparently have refrained from bidding against each other and not much progress has been made by the counties in that direction. In one county in the District all the doctors in the county met together and adopted a minimum fee schedule for county work and all agreed to abide strictly by it. This schedule was presented to

the Board of County Commissioners and accepted by them. Its rates were from $33\frac{1}{3}$ per cent to 50 per cent less than standard fees and the agreement is only made for the calendar year of 1933.

Respectfully submitted,

(Signed) LEE B. GREENE, M.D., Councilor.

NINTH DISTRICT

As Councilor for the Ninth District, I beg to submit a report for the activities of the Tri-County Medical Society for the year between June 1, 1932, and June 1, 1933.

At the present time we have fourteen paid up members in our Society. One other doctor of the District will soon join us. In all we had three visitors. Dr. J. P. LaPointe joined the Society, while Dr. J. R. Critchfield moved to Fargo; and Dr. L. J. Alger located in Grand Forks, after spending some time in Europe taking a postgraduate course. Four meetings were held during these past twelve months at various places. We usually meet on some Thursday afternoon at about 4:00 p. m. At about 6:00 p. m. we have dinner together in some restaurant.

Our major subjects of discussion have been as follows: Medical legislation, medical economics, the problem of caring for our war veterans, the care of the patients unable to pay for the services, the majority and minority report on the cost of medical care, and reports on interesting cases that have been encountered in our daily practice. Still another subject which we frequently discuss is the importance and service of the general practitioner and the specialist.

In conclusion, we are all very optimistic because the depression is over and because we are going to have good crops and paying prices for commodities our clients have for sale, all of which will mean brighter times for us all.

Respectfully submitted,

(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 held four meetings. We had planned to hold six meetings a year, but on account of the condition of the roads and weather, we were unable to do so this year. The average number of members present at each meeting was nineteen. The annual joint meeting with the Eastern Montana Medical Society held in Dickinson, September 24, was a very pleasant affair. Dr. E. J. Engberg of St. Paul being the guest speaker.

There are thirty doctors in our district who are eligible to membership. Of these, twenty-eight are members of the Society; one has retired from active practice, and one has been dropped for non-payment of dues.

Incidentally, we have just finished and had printed a new fee schedule. This was discussed item by item in open meeting before its adoption. Whether or not it will be workable remains to be seen.

We have been making an honest effort during the year to serve the doctors in our District in the best possible way. The work has naturally divided itself

along four principal lines, scientific, social, economic, and protective. None of these can be neglected by a society which is trying to do the most for its members.

On account of our financial condition and being such a distance from the larger medical centers, our scientific programs are quite a problem. We have, however, by using our own local men, had some very fine papers and discussions during the year.

Because our Society includes such a large territory and the members are so widely separated, the importance of the social part of the meeting is increased. Many of us never see each other from one meeting to the next, and we feel that much of the success of a Society depends upon the fellowship and good will which exists among its members. This we aim to promote by having a banquet before, and a social gathering immediately following, each meeting.

The economic or business side of the practice of medicine is too largely neglected by all of us, both as individuals and as societies. We have sought during the year to lay more stress upon this phase of the practice of medicine. Out of this has come a new fee bill with a determination among the members to maintain fair fees for services rendered and not to render services to those who are already in debt to some other doctor.

The protective features of our program are many and varied. We seek to protect each other from the cutting of fees, whether by members of our Society or members of outside societies, County Boards, or other political organizations. We try to protect each other from being pestered by quacks and cults of all kinds. We try to protect our members from malpractice and damage suits, and I do not believe any damage suit for malpractice would get far in our District.

The strongest factor in the success of our program is the fellowship and good will which exists among the doctors, and upon it the future protection and advancement of the medical science depends.

Respectfully submitted,
(Signed) A. E. SPEAR, M.D., Councilor.

REPORTS OF COMMITTEES

COMMITTEE ON PUBLIC POLICY AND LEGISLATION

Dr. L. W. Larson, Chairman, presented an informal report of this committee.

Dr. Murdock MacGregor moved that the House of Delegates recommend to the Council that Dr. Larson be authorized to get out a final report of the legislative activities during the year.

The motion was seconded by Dr. O. T. Benson and Dr. P. G. Arzt and unanimously carried.

COMMITTEE ON PUBLIC HEALTH

Dr. A. A. Whittemore presented the following report:

Your Committee on Public Health submit the following report:

July 1, 1933, will mark a fourth distinct epoch in the development of public health in North Dakota.

The first epoch might be said to constitute that period during territorial days when the public health meant nothing but quarantining for communicable diseases. The state department then had charge of the live stock sanitary board and the licensing of physicians.

The second epoch constitutes that period from the beginning of statehood to 1923 under a part time health officer, during which time the live stock sanitary board and the licensing of physicians was divorced. The registration of births was added to the duties of the department. Very comprehensive public health machinery was set up during this period, but no adequate appropriations were made for its maintenance.

The third epoch is covered by that period from 1923 to July 1, 1933, during which your department of health has functioned under a full time set up. During this time the state department was admitted to the registration area of the United States Government. Increased appropriations were obtained and substantial subsidies made available. A complete modern public health department was established with adequate divisions consisting of five bureaus: (1) Administration; (2) vital statistics; (3) child hygiene; (4) preventable diseases, and (5) sanitary engineering.

Birth and death registration reached 97 per cent. All certificates on file were bound and indexed. Communicable diseases are reported with increased regularity. The mortality incidence of the major communicable diseases has been reduced from 30 to 60 per cent in some instances.

Infant mortality has been reduced over 20 per cent, maternal mortality approximately 40 per cent, giving us for the second time in ten years the lowest rate in the United States.

The people and physicians are now public health conscious and co-operate with the department in splendid shape. Modern public water and sewage systems have sprung up everywhere and are under splendid supervision. Cities and towns have been induced to bring their milk supply under modern sanitary control.

Immunization against diphtheria, typhoid and small-pox has increased substantially. Many more points of vantage might easily be mentioned.

The impelling power which will plunge your department of health into a fourth epoch is linked with the great economic depression from which we are just emerging. It is predicted that this new epoch will be another ten years in duration. The last legislature cut 68 per cent from the appropriation, thus making it impossible to maintain a personnel of more than the health officer and one clerk. The directors of all of the enumerated bureaus will be cut out. The bureaus of vital statistics, sanitation and epidemiology are all out completely, and the bureau of child hygiene has been cut so severely that it will be impossible to maintain it.

Further, the last legislature amended and re-enacted the law creating the department of health, leaving it practically as it was before with a few minor exceptions. This was done for the purpose of reorganizing the department in such a way that the entire personnel

of the department might be changed in order to bring the department under political domination from which they have been hitherto unencumbered. All of this means that there is a grave danger that your department will fall under the influence of an untrained and inexperienced personnel. If this is so, a grave crisis is eminent. The registration of birth and deaths, the control of communicable diseases, public water and sewage, pure milk control, maternity and infancy work and health education will all have to be either dropped entirely or reduced to pure emergencies.

One other change in the law was made. The administration of the public health laboratories has been taken from the University and given to the Department of Health with such a reduced appropriation that the number of laboratories will have to be reduced and the efficiency of those retained materially handicapped.

The status of the present health officer is very uncertain. It is more than likely that he will be replaced by the new board when appointed. The salary has been reduced to \$200.00 per month. With cost of living in Bismarck steadily increasing it is unlikely that a trained person with experience will be obtained.

It is recommended that this organization (our State Medical Association) take the public health situation under advisement and some appropriate action be taken at this session.

In closing, this Committee, the Public Health Council, the State Health Officer and his entire staff wishes to thank the physicians of the state for their splendid co-operation during the past ten years, without which it would have been unable to properly function.

Respectfully submitted,

(Signed) A. A. WHITTEMORE, M.D., Chairman,
B. K. KILBOURNE, M.D.,
H. E. FRENCH, M.D.,
G. F. DREW, M.D.,
W. H. LONG, M.D., Committee.

This report was discussed informally by Drs. Skelsey, Whittemore, Brandes, Darrow and Ramstad.

Dr. Ramstad suggested that the attention of the Committee on Public Policy and Legislation be called to the report of Dr. Whittemore, and that this Committee be asked for suggestions as to how to remedy the public health situation.

COMMITTEE ON MILITARY AFFAIRS

Dr. L. B. Greene presented the following report:

The Committee recommends that the armed forces of the United States be not reduced beyond the minimum set forth in the Defense Act of 1920.

That Citizens Training Camps continue to be maintained.

That any attempt to discontinue Military Training and Military Science Courses at institutions of education where the same are at present maintained be absolutely opposed.

That medical men at present holding Commissions in

the Medical Reserve Corps be encouraged to retain them, and whenever possible be placed on an Active Reserve status.

Respectfully submitted,

(Signed) LEE B. GREENE, M.D.,
FRANK I. DARROW, M.D.,
ERIC P. QUAIN, M.D., Committee.

COMMITTEE ON TUBERCULOSIS

Secretary Skelsey read the following report that had been submitted by Dr. Fannie Dunn Quain:

It has been the pleasure of your Tuberculosis Committee to keep informed of the tuberculosis work attempted or accomplished since your last meeting.

The two agencies constantly at this work in the state are the State Sanitarium, San Haven, and the North Dakota Tuberculosis Association. Co-operating organizations include representatives of fraternal orders, church societies, service clubs, schools, women's clubs, and defense organizations. All but the defense organizations and the federated women's clubs are local. These latter organizations help locally and in their state groups. Two state groups of fraternal orders, the Masons and the A. O. U. W., have cottages at the Sanitarium and at Camp Grassick.

The co-operating agencies have aided in the distribution of literature furnished by the Tuberculosis Association; or donated money to the free bed fund of Camp Grassick or furnished sun-suits for the campers; or given jellies, towels, washcloths, and sheets, pillow-cases and blankets to the Sanitarium and the Camp, or sent reading material; or last but not least, have selected a child or children and provided for their stay at Camp Grassick. All of the agencies have helped in the sale of Christmas seals.

The State Health Department has not had special funds for tuberculosis work but they gave a large part of their program for the State Health Officer's meeting to this subject, this spring. Dr. Myers of Minneapolis and Dr. Stewart of Nanette, Manitoba, were speakers.

Tuberculosis Association—The North Dakota Tuberculosis Association has felt the depression the same as every other organization. The seal sale dropped to less than \$16,000 last season. The State Society uses 45 per cent of this in its work—the other 45 per cent is used by the localities in which the seals are sold for local health work.

The use of the 45 per cent by the State Association is as follows: Tuberculosis literature is furnished to all libraries, public and institutional, in the state.

Health educational material is sent to 8,000 elementary school rooms.

Special high school hygiene literature goes to all high schools in North Dakota.

All teacher training departments receive special material for class room use.

Health habit forming material is furnished all elementary schools.

Special literature on tuberculosis is sent to public health nurses and social workers in the state.

The current early diagnosis material has been sent to all doctors of the State Medical Society.

The Pennant is printed and distributed to from 5,000 to 8,000 interested individuals four times a year.

The Cleanliness Institute has turned over to our Tuberculosis Society, gratis, supplementary readers for all grades; tying up cleanliness with geography, English and history throughout the course. This is being distributed gratis to the teachers in rural districts for their school work.

The Society feels that with the distribution of this free knowledge of health and cleanliness that they are placing the tools of future strength into the hands of our young citizens and of those who are responsible for their instruction.

Camp Grassick—The greatest champion of death between the ages of 10 and 40 is tuberculosis. In our own state we have lost on an average of thirty-five young people every year for the last five years with this disease. How many contacts does that leave to develop and spread the plague? 'Teen age tuberculosis is on the increase. To combat and prevent this breakdown in our youth, thirty-eight states have established nutrition, fresh air, or sunshine camps—all preventoria for 'teen age tuberculosis. This is the "WHY" of Camp Grassick.

The funds were limited last year so camp was open only fifty-one days instead of seventy, as usual.

The number of children cared for was only seventy, instead of 110 as the year before (1931).

The ages of the children received varied from 7 to 14. They came to camp from 2 to 29 pounds underweight; the average gain was 6 pounds; 10 per cent were contact children. The average stay was thirty-eight days.

Ninety per cent were guests of the Free Bed Fund—surplus space was given to children whose parents paid for their privilege of camp life, but they all must show need of the service.

Two-thirds of the camp expense was supported by the Free Bed Fund, the other third came from the 45 per cent used by the State Association.

The Staff consists of paid director, nutritionist, nurse and cook, whose duties are obvious. The rest of the Staff are volunteer teacher-councilors who take charge of occupational work, story hour, nature study, jaunts, music and dramatics. They also guide the organization of the Little Citizens' League.

The Legion Auxiliary has set aside a certain amount to be used as support each year of from five to seven under-par children of ex-service men.

The Federated Women's Clubs sent four children last year. Many organizations endowed beds for one or two children.

Camp Grassick aims to build up the undernourished child with excellent food and rest; to rejuvenate him with sun baths and fresh air and send him back to school with enough resistance to stand the strain of the school year—and with health habits formed that will prevent the break-down during high school.

Every camper belongs to the Little Citizens' League, which teaches him regard for his fellow, and loyalty to his country—in other words, good citizenship.

The campers have come from all parts of the state.

Some years ago the Medical Society gave the Tuberculosis Association \$100.00 a year as their contribution to the work. If the Society could revive that custom and make their donation \$105.00, your Committee would be glad to select three needy children for Camp Grassick and report on their progress next year.

Direction of County Funds—The Association has tried to direct the expenditure of seal money by counties because the fund was being used for too many glasses and tonsil operations. It is hard to see how furnishing glasses can be interpreted as tuberculosis work.

Case finding is our first big job for counties and we have so advised. Mantoux testing of school children has been financed by Christmas seal money in Minot and in three towns in Burk County. Dr. Lucy Coon had charge of the testing in Minot and Dr. John Cowan in Burk County.

The co-operation of the Association in the drought area consisted in the use of local seal funds by public health nurses for follow-up work to the extent of \$2,200.

The Association has a movie of Camp Grassick which shows the activities of a day at Camp. This has been shown at a number of places in the state, with a talk, as a means of education as well as an advertisement for the work.

Two members of the Association financed their own trip to the National Tuberculosis Association meeting in Colorado Springs and the meeting of the Western Branch of the Public Health Association at Denver, Colorado.

The Sanitarium—Dr. Charles MacLachan has sent a comprehensive report covering the work at the institution for the last four years. His report is enclosed as it was received.

Respectfully submitted,

(Signed) FANNIE DUNN QUAIN, M.D., Chairman.

To the House of Delegates
North Dakota State Medical Association
Gentlemen:

Your Committee on Medical Education would submit the following report:

The School of Medicine at the University has continued to operate on the plan that is well known to you. Last fall, and now again for next year, it has had increasing demand upon its facilities on the part of well qualified students from the state, to say nothing of some 300 applications each year from non-residents that it has had to reject. Its graduates in 1932 and 1933 have found acceptance in clinical schools more readily than ever before. At the same time the School is in a more precarious position than it has ever been before because of the low appropriations for the University made by the legislature last winter. Should there be loss from the staff for any reason, it is

extremely doubtful whether the place or places could be filled with men of the required training and experience. Budgets for equipment and supplies have been reduced but not to the same extent as the budget for salaries. An effort will be made to continue the work on the same high standards, and rating bodies and other schools that accept its graduates into their advanced classes will no doubt be lenient, but should the School fail to merit full confidence and recognition as a whole or in any department, it will be unable to survive.

On Popular Health Education the Committee renews its recommendations of other years.

Respectfully submitted,

(Signed) H. E. FRENCH, M.D., Chairman,
C. R. TOMPKINS, M.D.,
G. M. WILLIAMS, M.D.,
W. C. FAWCETT, M.D., Committee.

COMMITTEE ON NECROLOGY

Secretary Skelsey read the following report which had been submitted by Dr. James Grassick:

NECROLOGY REPORT 1933

House of Delegates,
North Dakota Medical Association:

Let us for a few moments lay aside our material problems, forget our differences, lull to rest our petty ambitions and recall that those of our profession who are now asleep have left us all that we possess of tool and remedy, and all that we cherish of ethics and devotion. The members of our profession carve no marbles, rear no pyramids, build no temples, paint no canvases and compose no symphonies to leave behind as records of their existence. Their day's work is done and the impress of their art is made on the flimsy fabric of human life—as frail as a gossamer web and as transient as a summer cloud. Since last we met, eight members of our group have answered the final call, and memories alone remain. As we give them this, our personal tribute, which is their due, we cannot honor them better than by consecrating our lives as living forces to carry on the tasks they left unfinished. Ours the opportunity; ours the task, and ours the duty of keeping alive the Spirit of Service as a cherished and time-honored tradition of our profession.

PAUL M. KELLOGG

Dr. P. M. Kellogg of Dazey, North Dakota, was born in Red Wing, Minnesota, in 1887, and died at Dazey, North Dakota, August 11, 1932. He received his preliminary education at Red Wing, Minnesota, and graduated from the Medical Department of the University of Minnesota; interned at St. John's Hospi-

tal, Fargo, in 1909, and was licensed in North Dakota in April, 1910. He was physician and surgeon for the Indian School of Wahpeton, North Dakota, for a time, and then engaged in private practice at Toina, Rogers and Dazey. He was elected President of the Sheyenne Valley Medical Society in 1926. He also held the position of Assistant County Physician of Barnes County.

He was married to Miss Lila Gage, a nurse, of Fargo, North Dakota, who survives. Three daughters, Jeanne, Ruth and Madeline, also survive.

Dr. Kellogg was a splendid physician. He was bright, alert, affable and well thought of by his patients, and the profession. He was a hard worker, a good student, and always gave the best he had for those who came under his care.

JOHN STOBO HAMILTON

Dr. John S. Hamilton was born at Agincourt, Ontario, April 18, 1886, and died at Bathgate, North Dakota, August 22, 1932. He graduated from the Toronto High School and attended Knox College, Toronto. He then moved to Winnipeg, entered the University of Manitoba and received his B.A. degree in 1892, and graduated in theology from the same school in 1895. He was ordained by Pembina Presbytery in the spring of 1896 and placed in charge of the Presbyterian churches of Cavalier and Hamilton, North Dakota. He resigned the said pastorate in 1899, and entered upon the medical course in Manitoba University. He completed the course in the Kentucky School of Medicine, in what is now the University of Louisville, in 1902. He was licensed in North Dakota, January 15, 1903. From 1904 to 1906 he took charge of the Presbyterian Church at Chinook, Montana. From 1906 to 1916 he carried on a general practice at Hansboro, North Dakota, after which he moved to Bathgate, where he remained until the time of his death.

In 1903 he was married to Alice B. Wilson of Cavalier, who, with their daughter, Isabel, survives. Two brothers, Dr. T. Glenn Hamilton and Dr. James A. Hamilton reside in Winnipeg. He was a member of the Pembina Presbytery and of the I. O. U. W. and Masonic Lodges.

Dr. Hamilton was a cultured gentleman; licensed in the professions of theology and medicine he combined in a very marked degree the high ideals of the former and the requirements of a family doctor of the better type of the latter. With him there was no friction between the two; the practice of medicine was but applied religion, and theology was but a department of medicine. Ministering to a frail body often opened the gateway to an understanding of the deeper things of life, which correcting a morbid spiritual outlook made possible a restoration of bodily strength. Such was his religion and such his practice, a harmonious blending of the material with the spiritual. With more men like Dr. J. S. Hamilton, the conflict between science and religion would soon cease to be a bone of contention as it should.

ERIN BYRON CROSBY

Dr. E. B. Crosby, son of Nathan H. and Abigail Crosby, was born on June 2, 1881, at Watertown, South Dakota. Soon after, his parents moved to Kasson, Minn., where he attended the public schools of Kasson, graduating from high school in 1899.

He followed the teaching profession for a short time and then attended Hamline University for one year. He received an appointment to West Point Military Academy in 1902, where he received cadet training. Later he returned to Hamline University and received his medical degree in 1907. He served his internship at St. Mary's Hospital in Minneapolis, after which he located in Oriska, North Dakota, as a resident physician.

He was united in marriage to Katherine Kretchmer on October 20, 1911. One son, Nathan Erie, was born to this union on September 23, 1922. Wife and son survive.

After practicing at Oriska for sixteen years, Dr. Crosby moved to Valley City where he was affiliated with the Valley City Clinic to the time of his demise on January 7, 1933.

He was a member of the American Medical Association, Sheyenne Medical Association, the Kiwanis, Knights Templar, Shrine, Elks, the Woodmen, Degree of Honor, and Yeomen lodges. He acted as physician for the Northern Pacific Beneficial Association. He was a member of the Methodist Church.

A large concourse of friends and relatives paid final tribute to the worth of the departed at impressive funeral services. He was accounted a faithful friend, a good citizen and a worthy representative of our profession.

FRANCIS F. LANG

Dr. F. F. Lang graduated from Bennett College, Chicago, in 1912 and was licensed in North Dakota through reciprocity with Illinois on January 5, 1917. He practiced in Montpelier and Berwick, North Dakota, for a number of years and then located at Hettinger, North Dakota, where he remained until the time of his death, January 11, 1933. He leaves his widow and one daughter. He was 47 years old at the time of his death. He was an active member of the Southwestern District Medical Society.

ERNEST A. LEBIEN

Dr. E. A. LeBien, the subject of this sketch, was born in Germany, and passed away at Mercy Hospital, Valley City, January 17, at the age of 55. When five years of age he came with his parents to Kansas. There he grew to manhood and received his education in the schools of that state. He studied pharmacy and afterwards medicine at Washington University, St. Louis, from which he graduated in 1904. He immediately moved to North Dakota, spent a short time in Fargo and then located at McHenry, Foster County, where he remained until the time of his death. He was admitted to practice in the state in April, 1906. He was married in 1911 to Miss Cassie Husher of McHenry. From this

union were two sons, Wayne and Bidney, who, with their mother, survive. Dr. LeBien was the only physician in Foster County outside of Carrington. He served as health officer for the county for four years previous to his death. He took an active part in community welfare work and was a moving spirit in everything that had to do with bettering or beautifying his home city. He was held in high esteem by his professional brethren as well as by his patients, and his passing leaves a vacancy that cannot easily be filled. The Sheyenne District Medical Society was hard hit during the past year, three of its members having gone to their reward, Dr. LeBien being the last one called.

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 3, 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 and 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 Sheyenne 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.

JAMES DOUGLAS WINDELL

Dr. James D. Windell, born in Ontario in 1865, a graduate of Trinity University, Toronto, 1894. Licensed July 17, 1894, began practice at Park River, Walsh County, after receiving his license. After a few years he removed to Minot, North Dakota, was the third physician to begin practice in that city, where he remained for many years, finally moving to Spokane, Washington, where he died June, 1932.

A. S. NICHOLSON

Dr. A. S. Nicholson was born in 1881, graduate of National Medical College, Chicago, 1905. Licensed October 11, 1906. He practiced for a time at Williston, and was local surgeon for the Great Northern Railroad. He removed to Washington where he died at Longview, November, 1932.

Dr. Ransom moved the adoption of this report.

The motion was seconded by Dr. A. P. Nachtwey and unanimously carried.

COMMITTEE ON MEDICAL HISTORY

Dr. George M. Williamson reported that in accordance with the instructions given this Committee at the 1932 meeting the material which Dr. Grassick had on hand had been assembled and put in manuscript form. There was a great deal of interesting material and it was hoped that at some time in the future it would be possible to publish a second volume of North Dakota Medicine.

Dr. Williamson further stated that a number of copies of the first volume were still on hand, and suggested that it might be well to dispose of them at a reduced price to those who had not yet purchased a copy.

Secretary Skelsey stated that he had brought to the meeting several copies of the first volume and that they would be on sale during the meeting.

Dr. Williamson moved that these volumes be offered for sale during the meeting for \$2.00 each, or by mail for \$2.25.

The motion was seconded by Dr. Greene and unanimously carried.

APPOINTMENT OF COMMITTEE ON NOMINATIONS

The President appointed as the Committee on Nominations: Drs. Frank I. Darrow, Fargo; R. W. Pence, Minot, and T. L. DePuy, Jamestown.

Dr. MacGregor moved to adjourn.

The motion was seconded and the House of Delegates adjourned at 5:20 p. m., to reconvene at 12:30 Friday, June 2.

SECOND MEETING

FRIDAY, JUNE 2, 1933

The second meeting of the House of Delegates was held at the Kindred Hotel, and was called to order at 1:00 p. m. by the President, Dr. Paul H. Burton.

ROLL CALL

Secretary Skelsey called the roll and reported a quorum present.

President Burton declared the House duly constituted for the transaction of business.

REPORT OF AUDITING COMMITTEE

Dr. N. Oliver Ramstad presented the following report:

We have audited and compared the reports of the Secretary and Treasurer and find them correct.

(Signed) N. O. RAMSTAD, M.D.,
LEE B. GREENE, M.D.,
A. E. SPEAR, M.D., Committee.

Dr. Murdock MacGregor moved that the reports of the Secretary, Treasurer, and the Auditing Committee be accepted.

The motion was seconded and unanimously carried.

REPORT OF COMMITTEE ON NOMINATIONS

Dr. Frank I. Darrow, Chairman, presented the following report:

The Nominating Committee beg to submit the following recommendations:

President, Jesse W. Bowen, M.D. Dickinson
President-elect, C. E. Stackhouse, M.D. Bismarck
First Vice-President, A. D. McCannel, M.D. Minot
Second Vice-President, W. A. Gerrish, M.D.
..... Jamestown
Secretary, A. W. Skelsey, M.D. Fargo
Treasurer, W. W. Wood, M.D. Jamestown
Delegate to A. M. A., Paul H. Burton, M.D. Fargo

COUNCILORS

Fourth District, E. M. Ransom, M.D. Minot
Fifth District, F. L. Wicks, M.D. Valley City
Ninth District, E. L. Goss, M.D. Carrington

STATE BOARD OF MEDICAL EXAMINERS

L. B. Greene, M.D. Edgeley
Paul H. Burton, M.D. Fargo
A. D. McCannel, M.D. Minot

Respectfully submitted,

(Signed) FRANK I. DARROW, M.D.,
R. W. PENCE, M.D.,
T. L. DEPUY, M.D., Committee.

Dr. Frank I. Darrow moved that the rules be suspended and that the Secretary cast the unanimous ballot for these nominees.

The motion was seconded by Dr. A. P. Nachtwey and unanimously carried.

Dr. Skelsey reported the ballot cast and the President declared these gentlemen duly elected.

PER CAPITA TAX

Dr. F. L. Wicks moved that the annual dues remain as at present.

The motion was seconded by several and unanimously carried.

SELECTION OF MEETING PLACE

Dr. Frank I. Darrow, on behalf of the Cass County Medical Society, invited the Association to hold the next annual meeting in Fargo, in 1934.

Dr. O. A. Arneson moved that the invitation be accepted.

The motion was seconded by Dr. Meredith and unanimously carried.

NEW BUSINESS

Dr. O. T. Benson moved that a vote of thanks be extended to the Sheyenne Valley Medical Society for their splendid hospitality and many courtesies extended during the convention.

The motion was seconded by Dr. R. W. Pence and unanimously carried.

President Burton stated that he would write a personal letter of appreciation to Mayor Fredrickson, telling him what a good town Valley City is.

Secretary Skelsey read a letter from the Editor of THE JOURNAL-LANCET stating that they would be glad to reduce the price of THE JOURNAL-LANCET from \$2.00 to \$1.00, beginning January 1, 1933, and running through the calendar year.

President Burton requested Secretary Skelsey to write the Editor and convey the appreciation of the Society for this courtesy.

MEDICAL ECONOMICS

DR. H. A. BRANDES: In the presidential address and also in the reports of some of the Councilors, the economic problems confronting the profession were mentioned. I think we should give some thought to these problems. As many of you know, some of our counties are finding it increasingly difficult to take care of the sick who are without funds. Of course, the county commissioners are trying to make money go as far as possible. In this effort I have been told that some of the county commissioners have gone to the doctors in the community trying to get bids for this work. I think the medical profession should get together and probably have some sort of committee in the State Society whereby we could study this problem and arrange to set up some schedule of fees so that when the county commissioners consult the doctors or the county societies they may have something to refer to and that we can all agree on. Perhaps the same thing would hold true of some of the so-called mutual health organizations that are springing up. They always try to get low bids and attempt to exploit the doctors. I think if we had some committee that would arrange the schedule of fees that would apply to the county work and to these health agencies we could work through the county societies, and could perhaps get some action that would be satisfactory.

I suggest that a committee on medical eco-

nomics be appointed with the President on the committee, to make a study of this situation and get in touch with the local societies.

PRESIDENT BURTON: I think that is a very fine thought, and it is something I covered in my address. The county societies in some instances in other states have entered into a contract with the county commissioners and the society allocates the work to its members. In Iowa, where they did not get anything for such work formerly, they now get about two-thirds of their regular fee, and the county commissioners in Iowa have ruled that they can enter into contract for this work. I think it should be urged upon the county societies that something of this sort be done. I have turned over to Dr. Bowen all the material I had and I think there is opportunity ahead for a great deal of good, and I am sure we can run our clinics and take care of the sick in some satisfactory form.

PRESIDENT-ELECT BOWEN: I have already arranged for this committee for the coming year and have made Dr. Burton Chairman. We will get into communication with you, for I feel that we should take this up in every society. I am sure we can do good work in every district in the state. I have tried to designate members from each section of the state to study conditions and to confer with the different county societies.

CANCER SURVEY

DR. N. O. RAMSTAD: After listening to the oration on cancer control I thought it might be well to do something in North Dakota and wish to present the following resolution:

RESOLVED that the House of Delegates of the North Dakota State Medical Association approve and sponsor a survey of the cancer situation in North Dakota, and that the American Society for the Control of Cancer be requested to make such a survey, reporting its findings with recommendations to this Association.

I have been promised that if this survey is made the American Society for the Control of Cancer will take care of it and it will not cost us anything. I move that this resolution be adopted.

The motion was seconded by Dr. Frank I. Darrow and unanimously carried.

DR. N. O. RAMSTAD: To co-operate with that organization, I move that the President appoint a committee of five to render what aid and assistance they can in this work.

The motion was seconded by several and unanimously carried.

PRESIDENT BURTON: I have spoken to Dr. Bowen about this and as Dr. Quain is Chair-

man of our Cancer Committee I would suggest that we allow Dr. Quain to name the other members of the committee. I think in that way we will be more likely to get men who are interested in cancer. As soon as Dr. Bowen communicates with Dr. Quain we will get the personnel of the committee.

DR. H. A. BRANDES: Dr. Carr in his paper this morning called attention to the need of a psychopathic hospital in this state. I think this is out of the question at present, but in conversation with him he tells me that it is possible to treat psychopathic patients at the state hospital with the facilities they now have. As you know, some of these early mental cases and psychoneurotic individuals are difficult to treat in general hospitals, and the hospital stay is oftentimes a drain on the family resources so that it becomes an economic problem. Many are not able to go to private sanitariums, and it seems too bad that these individuals have to remain at home and finally develop a permanent mental condition or one that requires treatment over a long period. They are not insane but need mental treatment, and they can give such treatment at Jamestown. At present this means bringing them before an insanity commission and having them declared insane. It seems to me that as doctors we should bring about a change in that law. Two or three years ago I talked with one of the judges of the Supreme Court and he thought the law could probably be changed. I think the Committee on Public Policy and Legislation, or some committee, should consider this question and see if the law cannot be changed so that these individuals can be sent to Jamestown and treated there. If it is found that they are incurable they can then be committed. I think the name of the institution should be changed from "State Hospital for the Insane." I believe this is something we should consider seriously, for we have met with this problem time and time again.

PRESIDENT BURTON: I think there is no question that some arrangement should be made for the care of borderline cases.

FUTURE MEETING OF HOUSE OF DELEGATES

Secretary Skelsey asked for an expression of opinion as to the time of meeting of the House of Delegates at the 1934 session.

It was decided that the same plan in force this year, of having the first meeting of the House of Delegates on the afternoon of the day preceding the annual session, should be followed in 1934.

Dr. A. E. Spear moved to adjourn.

The motion was seconded by several and the

House of Delegates adjourned at 1:35 p. m. *sine die*.

A. W. SKELSEY, M.D., Secretary.

ADDRESS BY PRESIDENT—NORTH DAKOTA STATE MEDICAL ASSOCIATION

PAUL H. BURTON, M.D.

Fargo, N. D.

The ethical physician needs his brother's hand in his work far more today than he ever did before. All down through the centuries of civilization "United we stand, divided we fall" is the maxim that every doctor or surgeon worthy of the name must keep before his eyes. Abuse of medical charities, illegitimate and unethical methods of practice, and all other evils which have embarrassed the physician and reduced his income, can only be successfully handled by a well organized and compact medical profession, able to take a positive stand on these matters and to carry out its decisions.

There is in view, under thorough organization, relief from many of our present difficulties. There never will be devised a patent mechanism which will relieve the doctor of participation in our political activities. Physicians must govern themselves, or they will be misgoverned. The welfare of our society depends upon the support you give it. A well organized profession means greater respect and better compensation.

The majority report of the committee on the Costs of Medical Care not only sells the medical profession into bondage but holds up the taxpayer for the price of the sale. The process goes the old army game one better by selling a man something he does not want at a price he cannot pay.

Henry L. Mencken's magazine "The American Mercury" flings wide and far the intolerance for intolerance, and holds a niche of its own in the world of culture and literature. What a wry grimace, then, must wreath the lips of those of the intelligentsia, who formed the backbone and the vocal organs, if not the brain, of the "Committee on the Costs of Medical Care" when they read the article, "What Is Going on in the World."

In the March, 1933, number of "The American Mercury" Mr. Mencken's final pronouncement on the entire report is as trenchant as it is terse. Writes he in conclusion: "In all this, I may seem to be venturing to tell the medical grandams how to suck eggs. If so,

I apologize most humbly. My excuse is that the report which now disturbs them is addressed, not to the profession only, but to the general public, and that its recommendations, if carried out, would make every American his brother's keeper with a vengeance."

That they lie within the range of practical politics I doubt seriously; the movement, indeed, has begun to turn in the other direction, and I hope to see the day when health departments are restored to their proper functions of dealing with general menaces to the people's health, and free medical service is restricted to the actually indigent.

The great majority of medical men might, with perfect accuracy, be classed as easy marks. The men of no other profession are so easily operated on by specialists in other people's duties. They walk into the arms of every new uplifter who happens down the road.

Let us hope that the report of the Committee on the Costs of Medical Care, with its bold proposals to reduce us to a kind of peonage, will at least awaken us to the fact that with everything else equal, the more we regard these duties the better we will be able to serve our patients.

Activities of our health departments a generation ago were pretty well confined to compiling vital statistics, to safeguarding water and food supplies, and to maintaining quarantines against contagious diseases; but of late they have gone in for doctoring and nursing on a truly colossal scale, and when the the supply of customers runs out, they actually send catchpolls to track them down. If free dispensaries be counted in as part of their service—and the Committee on the Costs of Medical Care itself apparently so counts them—then the health departments have gobbled at least a half of the work that private doctors were doing thirty years ago.

The doctors have let themselves be hustled and run amuck by the public health brethren. The public health business tends more and more to fall into the hands of professional uplifters, and they spend a great deal more time discussing what ought to be done than what can be done. Their chief postulate seems to be that it is the bounden duty of the state to take care of every citizen who can't, or won't take care of himself; and they are always eager to pour out the taxpayer's money to that end.

I attended two Northwest Regional Con-

ferences last winter; one in Minneapolis, and the other in St. Paul, where practically all phases of medical economics were most ably discussed and I want to urge upon the officers of our association the importance of these meetings. The County Medical Societies in Iowa and Wisconsin have entered into contracts with the County Commissioners for the care of the indigent sick. They are incorporated to take care of the indigent as a body. The Attorney General of Iowa has ruled on this matter, stating that according to laws now existing the Medical Society can and should enter into a contract with the County for this work. Dr. R. L. Parker of 3510 6th Ave., Des Moines, Iowa, says he will be glad to send a model contract to any one who asks for it. Dr. George B. Larson of Frederic, Wisconsin, states that there has been much improvement in the fairness of the care of the poor since the County Medical Society has taken it over. The doctors are now paid about 50 per cent of the standard fee basis, which is far better than receiving nothing, as they used to do. The far-seeing medical man will have to develop some plan for taking care of the distribution of medical care to the indigent.

I would strongly urge that each County Society make a survey of every agency which has to do with human welfare in any way. When these organizations see that the medical profession is going at this thing scientifically, and in a sane, calm way, they will be more convinced that they (the physicians) can solve the problem best, since it affects them most directly.

The Iowa State Medical Association has created a Speakers Bureau to create scientific advancement for its members and to promote education of the laity, and the best time to educate the laymen is in the course of their other education, that is, during their high school and collegiate work.

I strongly urge that each County Medical Society should organize a Physically Handicapped Children's Clinic. Medical activities in North Dakota should be sponsored by medically trained individuals. All Clinics in North Dakota, in order that they may be highly successful, must necessarily be organized and operated under direct County Medical Society supervision. Many Clinics held in North Dakota for a considerable number of years have been sponsored by lay organizations, although the actual clinical work has been done by physicians, members of the State

Medical Society. No one denies that much good work has been done by many of these Clinics, but they would no doubt have been more successful under strictly medical supervision. It is quite obvious that a higher degree of co-operation (a most desirable factor for good) would have been attained if the local County Medical Society had been responsible for the Clinics, both as to arrangement and operation, and if some physician would have assumed responsibility for the after care suggested for each particular patient.

No one can deny the fact that many times the medical profession has been imposed upon through many patients being referred to Clinics for care, when they are able to pay at least a modest fee for each particular patient. It is recommended in the outline that all patients able to do so, should pay a reasonable fee for services rendered, to reduce to the minimum unnecessary pauperization; although, of course, final decision in this, as well as all other questions relative to the operation of Clinics, is a matter to be decided by the County Society itself. Through the assistance of many organizations desiring to cooperate in this humanitarian work, it is believed that no difficulty should be experienced in the average North Dakota Community to solicit funds to take care of the Clinic.

Good health is man's most treasured possession, and I am sure that the laity, if properly informed as to the advantages of periodic health examinations, with a complete physical check-up and a carefully written record of each patient kept on file, with an understanding that the patient is to report at definite periods for a physical inventory of his body, so that disease, if any existed, could be discovered and treated in its early stage, will agree that such a procedure is the best form of insurance against disease. Such a program can and should be fostered by our Association, working in co-operation with the Press and all other legitimate forms, distributing information, and having especially a Speakers Bureau of our Association.

PROCEEDINGS OF THE COUNCIL OF
THE NORTH DAKOTA STATE
MEDICAL ASSOCIATION
1933

FIRST MEETING

WEDNESDAY, MAY 31.

The first meeting of the Council was held at the Masonic Temple, Valley City, and was called

to order at 5:30 p. m., by the chairman, Dr. E. M. Ransom, Minot.

REPORT OF COMMITTEE ON PUBLIC POLICY
AND LEGISLATION

Dr. L. B. Greene moved that the Council authorize the expenditure of a sufficient sum to cover publication and mailing of a report of the activities of this Committee during the past year.

The motion was seconded by Dr. P. G. Arzt and unanimously carried.

COMMITTEE ON TUBERCULOSIS

Dr. George M. Williamson moved that the Council authorize a donation of \$105.00 to the Committee on Tuberculosis for the ensuing year.

The motion was seconded by Dr. N. O. Ramstad and unanimously carried.

EXPENSE OF ANNUAL SESSIONS

Dr. L. B. Greene moved that the present sum of \$200.00 to apply to the expense of the annual sessions be continued for another year.

The motion was seconded by Dr. J. J. Seibel and unanimously carried.

LEGISLATIVE ACTIVITIES

After some informal discussion, Dr. L. B. Greene moved that the chairman of the Committee on Public Policy and Legislation be authorized to expend not to exceed \$100.00 during the coming year in addition to the amount necessary to publish a final report.

The motion was seconded by Dr. A. E. Spear and unanimously carried and the Council adjourned at 6:15 p. m.

The following Auditing Committee was appointed: Dr. O. N. Ramstad, chairman; Dr. L. B. Greene and Dr. A. E. Spear.

SECOND MEETING

FRIDAY, JUNE 2.

The second meeting of the Council was called to order at the Kindred Hotel at 1:40 p. m., by the chairman, Dr. E. M. Ransom, Minot.

SALARY OF SECRETARY

Dr. L. B. Green moved that the annual salary of the secretary remain as at present.

The motion was seconded by Dr. N. O. Ramstad and unanimously carried.

MEDICAL HISTORY

Dr. F. L. Wicks stated that the Fifth District had no representation in the first volume but that since that time Dr. Grassiek had been furnished with material covering the history of the early work of the profession in this District and bringing it practically up to date, so that the record

of the work in this District could now be complete.

The Auditing Committee reported that it had found the reports of the State Secretary and of the State Treasurer correct as rendered. Moved, seconded and carried that said reports be accepted.

COMMITTEE ON MEDICAL EDUCATION

Dr. N. O. Ramstad stated that the House of Delegates had overlooked the election of a Committee on Medical Education, and stated that his understanding was that the Council reserves the right to have a hand in the educational program of the State.

President Burton expressed the opinion that this power could be given to Dr. Jesse W. Bowen, as incoming president.

Dr. Ramstad moved that the Committee on Medical Education for the coming year be appointed by President Bowen.

The motion was seconded by Dr. Murdock MacGregor and unanimously carried.

ELECTION OF OFFICERS

The following officers were elected: Dr. L. B. Greene, Edgely, chairman; Dr. George M. Williamson, secretary.

As this completed the business before the Council for the Forty-Sixth Annual Session, the meeting was declared adjourned at 1:50 p. m., *sine die*.

GEORGE M. WILLIAMSON, M.D.
Secretary of Council.

PROCEEDINGS OF THE GENERAL MEETINGS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION 1933

FIRST DAY

THURSDAY, JUNE 1—MORNING

The first general meeting was called to order at the Masonic Temple, Valley City, N. D., at 9:00 a. m., by the president, Dr. Paul H. Burton, Fargo.

Address of Welcome—Hon. Fred J. Fredrickson, Mayor, Valley City.

Mr. President, members of the North Dakota State Medical Association, it is usually a formal proceeding to listen to an address of welcome, but I can assure you that today I am sincere in extending to you the hearty welcome of Valley City. I am told that it is twenty-one years since Valley City had the great honor of entertaining this body, and we are happy indeed to have you here again as our guests. I hope you will find your hosts as hospitable and entertaining as you have a right to expect.

Since I am representing the city it might be interesting to you to hear a few things about Valley City. Our city is about fifty-eight years old, is at this time the seventh city in the state and has a reputation for its churches, schools and natural beauty. Those of you who were here last evening probably noticed what we believe to be one of the best lighted cities in the northwest, and we are proud of this fact. The reason we can have so much light in our city is that we have a municipally owned light plant. All light is furnished to the city without any expense to the taxpayers. Based upon what neighboring cities paid for lighting last year, it would have cost us \$20,000 to light our streets the way they are lighted.

It may be interesting to know that up to a short time ago, and I think until today, Valley City is the only city that has had on its books the standard milk ordinance recommended by the Public Health Service, and we think this is a splendid thing for any city to have. This is largely due to our Health Officer, Dr. Moore. We are trying it out, and while we have a little trouble once in a while we think it is a great help to those interested in dairy products.

Those interested in geologic problems may know that the river is here because of the glacial drift deposited many years ago. To those interested in this phase it is interesting to drive up the river and look at the many thousands of rocks that have been deposited there.

We have a State Teacher's College here with which many of you are familiar, and of which we are justly proud.

While you are here let me assure you that you need have no concern with the parking or the traffic regulations, and your automobile is safe. It is the hope of the City Administration that you will enjoy your stay here, that you will profit from your scientific deliberations, that you will go away with happy memories and that you will return to your homes in safety, with the feeling that your time here has been well worthwhile.

Response to Address of Welcome—Dr. George M. Williamson.

Mr. Mayor, Mr. President and Fellows: On behalf of the North Dakota Medical Association, I thank you for this cordial welcome to your fair city. It is a pleasure for us to be here, and I am sure we will return to our homes after the close of this meeting with happy recollections of the splendid entertainment we will surely receive from your people.

The name Valley City carries weight throughout our State—beautifully located in the Sheyenne Valley, a seat of learning and culture—the hospitality of its people knows no bounds. From your splendid Normal School has gone forth many a young man and woman who has directed the youth of our State not only in the fundamentals of their education, but also in the finer qualities of life taught them while attending your institution; your citizenship is high class and a fitting example in morals and industry to the young men and women who sojourn with you during each year.

Valley City has a state-wide reputation as a musical center, in fact, I do not know any city of its size that undertakes more pretentious musical programs and makes them a success financially. You are surely a music loving community. I well remember the musical program presented to this Association when we met here before, I feel there is something good in store for us this time.

This is the third time this Association has met here, first in 1894, the officers of our Association were: Dr. I. N. Wear, president; Dr. G. A. Carpenter, secretary, and your own Dr. J. A. Rankin, treasurer. The second meeting was in 1912—Dr. C. E. Spicer, practicing here at the time, was president; Dr. H. J. Rowe, secretary, and Dr. Frank J. King, treasurer, all of the above named officers excepting Dr. G. A. Carpenter have been called to the great beyond.

At this time it might be of interest not only to you and the people of your city, but also the members of this Association to know some of your early medical history. I quote largely from manuscript in my possession written by our historian, Dr. James Grassick, beloved and honored by the profession of our State, to whom we are deeply obligated for compiling the History of Medicine in North Dakota and who has furnished material enough for a second volume.

In 1878, the present Valley City consisted of a railroad house, water tank, one or two frontier shacks, and a population of perhaps a dozen. This followed the building of the Northern Pacific Railroad through this territory.

To this settlement as its first practitioner of medicine, came Dr. S. B. Coe, father of Dr. H. W. Coe, second president of the North Dakota State Medical Association. Dr. Coe was a man of parts, and his activities were by no means limited to medicine, for he established the city's first newspaper, the Northern Pacific Times, held offices of responsibility within the gift of the

settlers, and filled a place of usefulness in this area in the early period of its development.

In the early 80's a rush of settlers brought the population of the town to 1,000 or more.

Soon a number of pioneer physicians found locations here. Dr. DeVaux was the second physician to arrive. He practiced his profession until 1895, and was associated in the drug business with Mr. F. C. Clark. Dr. DeVaux removed from Valley City to Chicago, where he engaged in the Pharmaceutical manufacturing business and there remained until death. He was State Health Officer from 1893 to 1895.

Dr. George Harvey came as the next doctor and also entered the drug trade. He practiced about ten years when he died. About this time also came Dr. A. C. Campbell, who engaged in the practice of medicine about five years.

Dr. J. W. Vidal came in 1881—practicing for a time and then removed to Fargo.

Dr. L. E. Benson arrived in the early 90's, by this time the frontier town had now become a thriving city of 2,000 population. Dr. Benson remained for about ten years, then departed for a visit to South Africa; returning, he went to Alaska, and probably died in that country.

About this same time came Dr. J. W. Sifton, who practiced here for a number of years. He sold his practice to Dr. E. A. Pray and removed from the community in 1895.

Dr. T. Taams was a Valley City doctor in the early 90's as also was Dr. H. E. Ferrin.

Dr. L. S. Platou practiced for a time in Valley City, and served the city for six years as its Mayor, he later removed to Fargo. Dr. A. W. MacDonald who was first located at Courtenay came to this city in 1897 and became associated with Dr. Platou.

On December 8, 1904, a group of men met to form Barnes-Griggs Medical Society, among them were: Drs. C. L. Brimi, Cooperstown; A. C. Leslie, Hannaford; W. B. Wanner, Wimbledon; J. R. Truscott, Binford; A. A. J. Lang, Sanborn; C. E. Spicer, Dazey; W. C. Nolte, Dazey; W. R. Claybough, Litchville; F. R. Rasmusson, Kathryn; M. D. Westley, Cooperstown, E. D. Spear, Nome. Dr. Platou was elected president and Dr. Brimi as secretary. On April 5, 1905, the Society celebrated its birth at a banquet, printed menu and program, receiving its charter with its name changed to Sheyenne Valley Medical Society, and has continued to function as such under the jurisdiction of the State Medical Association. This Society has

given to the State Society, two presidents, Dr. C. E. Spicer, 1912, Dr. E. A. Pray, 1919.

Dr. J. VanHouten, one of your successful practitioners had the distinction of owning a splendid dairy herd and served this community with grade A milk for many years before such a grade was known and designated.

Your city is fortunate at present in having a corps of high class, well trained physicians and surgeons. I know them all personally and some intimately. They take an active part in the affairs of the State Medical Association and have prepared a scientific program of marked excellence and high quality. It hope in the not too distant future that we receive an invitation to visit you again.

SCIENTIFIC PROGRAM

FIRST DAY

THURSDAY, JUNE 1—MORNING

Dr. F. C. Rodda, Minneapolis, gave a Pediatric Clinic and presented several interesting cases.

Dr. Melvin S. Henderson, Rochester, Minn., gave an Orthopedic Clinic and demonstrated several interesting patients.

The meeting was declared adjourned at 12:10 p. m., to reconvene at 1:30 p. m.

FIRST DAY

AFTERNOON

The Association reconvened and was called to order at 1:45 p. m., by the president, Dr. Paul H. Burton, Fargo.

Dr. Burton presented his Presidential Address.

Dr. Richard E. Scammon, Dean of Medical Sciences, University of Minnesota, addressed the Society on "Guild Medicine."

Dr. Melvin S. Henderson, Rochester, Minn., read a paper entitled, "Bone Tumors."

Discussed by Drs. Harry Fortin, Fargo; Frank I. Darrow, Fargo, and in closing by Dr. Melvin S. Henderson.

Dr. F. C. Rodda, Minneapolis, read a paper entitled, "Intussusception."

Dr. W. H. Bodenstab, Bismarck, read a paper entitled, "The Doctor and the Workmen's Compensation Bureau."

Dr. Frank L. Rector, American Society for the Control of Cancer, Evanston, Ill., presented the "Canti Cancer Film."

The meeting was declared adjourned at 4:45 p. m., to reconvene at 9:00 a. m., Friday.

ANNUAL BANQUET

The Annual Banquet was held at the Rudolph

Hotel at 6:30 p. m., with Dr. Frank I. Darrow as toastmaster.

A musical program was furnished by representatives of the Teacher's College, and included contralto solos by Miss Inez Corby, songs by a male quartet consisting of John Julian, Art Lee, Vernon Eberly and Dick Halvorson, and selections by a trumpet trio made up of Ralph Law, Bennett Brudevold and Ralph Rinker.

Dr. Frank L. Rector, Evanston, Ill., delivered an address on "Cancer Control in North Dakota."

Mr. L. Benshoof, Editor, The Detroit Record, Detroit Lakes, Minn., delivered an address on "Medical Publicity."

Toastmaster Darrow expressed his appreciation to the local society for the splendid entertainment and the refreshments, and thanked the essayists for their courtesy in appearing on the program.

The meeting was declared adjourned at 10:15 p. m.

SECOND DAY

FRIDAY, JUNE 2—MORNING

The Association reconvened and was called to order at 9:30 a. m., by President, Dr. Paul H. Burton, Fargo.

Dr. John de J. Pemberton, Rochester, Minn., gave a clinic on "Diseases of the Thyroid Gland" and presented several interesting cases.

Dr. John D. Carr, Jamestown, read a paper entitled, "The Promotion of Preventive Mental Medicine." Discussed by Dr. J. R. Ostfield, Fargo.

Dr. Frank I. Darrow, Fargo, read a paper entitled, "Diabetes Mellitus."

Dr. Alano E. Pierce, Minot, read a paper entitled, "Coronary Thrombosis."

Discussed by Dr. J. O. Arnson, Bismarck.

The Association adjourned at 12:30 p. m., to reconvene at 1:30 p. m.

SECOND DAY

AFTERNOON

The Association reconvened and was called to order at 1:45 p. m., by the president, Dr. Paul H. Burton, Fargo.

Dr. Burton introduced the newly elected president, Dr. Jesse W. Bowen, who took the Chair.

Dr. John de J. Pemberton, Rochester, Minn., read a paper entitled, "Carcinoma of the Rectum and Rectosigmoid."

Discussed by Dr. R. H. Waldschmidt, Bismarck and Dr. Pemberton.

Dr. A. M. Brandt, Bismarck, read a paper entitled, "The Diagnosis and Treatment of Uterine Bleeding Not Due to Pregnancy."

Discussed by Dr. J. H. Fjelde, Fargo.

President-Elect, Dr. C. E. Stackhouse, took the Chair.

Dr. J. F. Hanna, Fargo, read a paper entitled, "Treatment of Persistent R. O. P. Position."

Discussed by Dr. J. L. Conrad, Jamestown.

The paper of Dr. L. W. Larson, Bismarck, entitled, "Legislative Matters," and the paper of Dr. J. D. Graham, Devils Lake, entitled, "Rectal Anesthesia in Obstetrics," were read by title.

Dr. Stackhouse, on behalf of the Association, thanked the guest speakers for their courtesy in contributing to the program, and declared the Forty-Sixth Annual Session adjourned at 4:30 p. m., *sine die*.

A. W. SKELSEY, M.D.

Secretary

REPORT OF THE NORTH DAKOTA DELEGATE, ANNUAL MEETING, MILWAUKEE, 1933

Hotel Schroeder headquarters of the Board of Trustees and of the Delegates. Scientific exhibits, general commercial exhibits, and places of assemblies for various sections, all held in the Milwaukee Auditorium, which was conveniently near to headquarters. Excellent weather throughout the sessions. Attendances of medical men and women, 4,601, and to this should be added the wives, as also many hundreds of people connected with the various exhibits. North Dakota registered only 18.

Over 100 delegates at the opening session. Speaker commended the action of a number of last year's delegates upon reporting through their state journals the proceedings of the national meeting.

Introducing President Cary, the speaker referred to the unusual fact that Dr. Cary had travelled over 99,000 miles on our official business; that he had been away from his home for 340 days, in keeping 80 engagements where he was the national organization's official representative.

President Cary's annual address: (Some high spots). During this era of economic and professional depression, great restlessness among some of the members of our profession; some too ready to adopt new methods of practice or to become attached to untried claims which seem to offer quick monetary returns. . . . He (Dr. Cary) is opposed to Federal laws affecting the practice of medicine when directed by bureaus under lay control from the seat of the national government, e. g., such schemes as the Sheppard-Towner Act. . . . Discussed the question of so-

called veterans' legislation, now in better shape than a year ago, thanks to the co-operation of the Government, the A. M. A., the Economic League, and some of the official of the American Legion. We must not lose sight of the fact that the present governmental program is also the result of the greatly depleted national treasury. Be warned that if the economic situation should improve before the present policy of retrenchment is well established, the demands of the veterans having non-service-connected disabilities may re-establish abuses of governmental aid to which we and some of the public have objected. Vigilance and opposition needed here through the medical fraternity. . . . Approves the Minority Report of the Five Year Committee on the Costs of Medical Care. Cites the necessity of having unity of spirit and of professional desire among the members of all county medical societies. Ever to be kept in mind and preserved is the right of the patient to chose his physician. Hospital budgeting plans should never include medical services. These two services should be kept distinctly separate. . . . The relation of the private physician to the health department. Non-medical health officers should be replaced by regular physicians. . . . The attitude of society should be directed to its own responsibilities. It should either correct the causes leading to dependence or assume its burden as related to the sick, so that this present demand on the profession is cared for by society and not expected of the doctors. Indigence should not be encouraged, but should be recognized as a part of the social deficiencies which are to be met from a general fund. . . . The Journal A. M. A., thanks to its ability to quickly and accurately distribute information, is of great value to the profession, and also of much service to the public. Its outstanding position in the medical journal field is noted. It is of moderate cost, for value received. During the past year an income of \$76,000 from our reserve, enabled the Journal to carry on successfully and financially. . . . Despite these trying times our Board of Trustees have acted so efficiently that our reserves have not been impaired. . . . Hygeia continues to be self-supporting. Very helpful in correcting and eliminating much misinformation. . . . Commends the Committee on Foods. Thinks it is generating influences which will be far-reaching. (Here, perhaps, the doctor is rather too enthusiastic. He should hear the comments on some of the radio talks, whence the high-pressure talking salesman for foods, syrups, canned goods, bread, etc., tell the air-public that their goods have the seal of

approval of the A. M. A.) . . . No new Chicago headquarters this year.

Address by President-Elect Dean Lewis of Baltimore, quite naturally and truthfully starts off with the remark that the physicians have suffered acutely during the financial depression. Many have rendered service freely without complaint. . . . Notes the rather curious fact that during periods of depression the morbidity and mortality are less than during periods of prosperity and inflation. (Data of this nature is well brought out by such organizations as the Metropolitan Life Insurance Co., which handles a vast amount of industrial, accident and sick benefit insurance. A great deal of this improvement in health conditions can be found in districts and communities not connected in any way with highly organized medical services, endowed experimental foundations, etc. In its Bulletin for June, 1933, the Metropolitan states that though both white and negro policy holders shared in the general health improvement, and that the death rate for each reached a new minimum last year, yet among approximately two millions (2,000,000) negroes insured by its company in its industrial department, there was actually a greater reduction in the mortality rate than obtained among insured white persons). . . . Refers to the former plans of the Government for extensive hospitalization under which about seventy (70) per cent of the hospitalized cases represented non-service-connected disabilities, including obesity, gout, etc. Now a change of plan, to eliminate these non-service-connected disability applicants. Dr. Lewis believes that any man discharged from the army and the navy who is now able to make his living, has no lien on the Government. Urges watchful care against efforts to bring back the former plan which had been built up through pressure upon legislators. The public should be educated regarding the enormous financial burdens that had been placed upon the Government. . . . Regarding medical care and hospital expense, Dr. Lewis took a fling at some of the enthusiasts preaching compulsory insurance, especially through Federal aid. He thinks that by judging the performance of the business world during the past few years, it can frankly be admitted that the medical profession has shown more ability to take care of its own business. . . . Better hospital planning suggested, as regards costs of construction and also limiting the number of hospitals according to population. . . . Medical education has now reached such a high type, that Dr. Lewis believes the graduates

of such schools should be admitted to practice without examination before state boards.

APPROVED

That state societies elect their delegates far enough ahead so that their names may appear in the Hand Book, which is published a month or two before the national annual meeting.

Medical schools should restrict the amount of clinical material used, to the amount actually needed for teaching and research.

Medical schools should not enter into medical practice in competition with private practitioners.

The Minority Report on the Five-Year Committee on Cost of Medical Care. Recommends an extensive campaign to educate and inform its constituency.

The Committee's Report on Mental Health; Available Hospitals, etc. A separate booklet on this subject has been issued from A. M. A. headquarters and is well worthy of study.

In medical schools, devising a course of lectures and demonstrations related to medical ethics, office and business practice details, relationship of the physician to the patient and to the public, etc.

That in radio talks by medical men, the subject of *foods* also should be included.

Arrange for printing of the thirteenth edition of the A. M. A. Directory, for which much data now is in hand.

A proposal to change the date of meetings of the State Secretaries in Chicago, from November to some date in September (tentatively 22nd and 23rd), and also have a Fall meeting of the Board of Trustees concurrently.

Resolution of Psychiatric Service in the Administration of Criminal Justice: A survey of prevailing methods. Urges constituent and component medical societies to devote at least one meeting annually, to which members of the local bar associations shall be invited, for the joint discussion of psychiatric service in the administration of criminal justice and the treatment of the offenders.

Resolution regarding Prevention of Blindness by Examination of Pregnant women. This has special reference to syphilis.

Resolution from Wisconsin State Medical Association that declarations of opinions regarding social, economic, and legislative resolutions of medical practice should come through approved channels,—the A. M. A. headquarters.

REJECTED

Resolution calling for a plan to establish in

Washington, D. C., a Bureau of Information, with properly equipped office, personnel, etc.

The Resolution from Iowa for the Creation of an A. M. A. Committee for the Study of Birth Control; enlisting *our* Board of Pharmacy and Chemistry to render all reasonable assistance and advice to this proposed committee. (Due probably to the desires of the orthodox theologians and also of those members A. M. A., who do not believe that our national organization should stand sponsor for this subject or to the bringing forth of some definitely reliable contraceptive, mechanical or otherwise, the resolution was considered taboo, and "tabled" by a vote of 66 to 46. Perhaps the proponents for this resolution and search for the "definite" had been reading such Malthusian literature [suggestive] as may be found for instance in Rufener's Economics: "Estimated population of the earth 1,750,000,000. Three-fourth of the earth's surface is covered with water, and of the one-fourth that is left, less than three-fifths is fertile. So that at present each person [having the price?] is entitled to only eleven acres. But while the population of the earth continues to grow, its area remains the same; hence the number of acres per capita grows ever less and less; and one hundred years hence it may be less than five acres; beyond the earth they cannot grow." Nor does the writer specifically refer to the amazing fecundity of such races as the Japanese, now reaching out for the rest of the earth, especially Manchuria and China.)

Resolution calling for an evaluation and comparison of the merits of the curriculum of approved medical colleges and those alleged colleges operated by cults. No necessity for this additional expense. Information already on file and available at our Chicago headquarters.

Resolution urging advisability of accepting a year of association with an approved general practitioner of medicine, in lieu of the interne hospital year for all graduates desiring to enter general practice.

The suggestion of the New York State Medical Association that the term "medical economics" be changed to read "economics of medical service."

Pennsylvania State Association's resolution for an annual observance of a so-called "Health Day." (This should bring forth a sigh of relief from the overburdened pastors and publicity men who are so often asked to talk or preach on "this day, and that day," including the commercial mother's day, arbor day, thrift day, etc.)

Not fully approved, but in harmony with:

A resolution that physicians on the staffs of

hospitals approved for interne training by the Council on Medical Education and Hospitals, should be limited to members in good standing with their local medical societies. Yet at the same time the Committee on Resolutions recognize that it may not be desirable at present to make this a hard and fast rule.

Referred, without comment, to the Council on Medical Education & Hospitals:

A resolution calling for the study and the devising of a plan that will abolish the so-called state board examinations, and in lieu thereof accept a certification of an approved medical college as to the candidate's training and graduation.

The designation and the setting-off of specialists. This subject again came up. Suggested that better use be made of the A. M. A. Directory and its designations. Commends the efforts of the various specialty boards now in existence, supplemental to the A. M. A. Reference Committee refers back, without comment, to Council on Medical Education and Hospitals resolution calling for the "devising of a plan and a procedure for the certification of specialists in all branches of medicine and surgery."

Recommended that the Bureau of Public Health and Instruction impart through effective channels its studies, conclusions, and recommendations for the information, advice and guidance of the public and the profession, in order that our social re-adjustments may be influenced by such authentic and dependable information and recommendations.

Fellowship and Delegates: At the second meeting of the House of Delegates, a delegate from North Carolina, endorsed from his state, was refused a seat in the House because he was not a Fellow of the A. M. A. (Under the rules of the national society, a state physician cannot legally be elected as a delegate to the National House unless for the two years preceding such state election he had been a Fellow A. M. A. This *faux pas* down South must have caused the supposed delegate some embarrassment).

Report of Reference Committee upon Reports from the Board of Trustees and from the National Secretary: As compared with the commotion of last year, in New Orleans, caused by the bringing in of animated comments upon similarly-titled reports, this year's response was practically angelic: consisted of highly-flattering clauses, such as "views with satisfaction;" "highly commends;" "applauds;" "approves." So the sailing was smooth.

Reference Committee on Medical Education:

A very valuable book (560 pp.) has been published recently through the co-operation of our regular medical colleges, the A. M. A., the Rockefeller, the Carnegie, and the Macy Jr. Foundations. Represents about an eight-year survey. (Office: The Director of Study, 630 West 168th St., New York City).

American Medical Students in Foreign Universities, and Foreign Students, Graduates Abroad, Seeking Admission to American Practice. These subjects have been given consideration. Some necessary restrictions will have to be made effective.

"Medical Relations Under Workmen's Compensation," a hand book of 160 pages, has just been issued by the A. M. A. headquarters, under the auspices of our national Bureau of Medical Economics.

The secretary of the Canadian Medical Association was introduced at the meeting June 15th. The British Medical Association cabled greetings.

ELECTION OF OFFICERS

President-Elect, W. L. Bierring of Des Moines, Ia.

National Secretary, Dr. Olin West of Chicago.
National Treasurer, Dr. H. L. Kretschmer of Chicago.

Speaker House of Delegates, Dr. F. C. Warnshuis of Michigan.

New Member Board of Trustees, Dr. C. B. Wright of Minneapolis, Minn.

It will be noted that the West and the Northwest through the election of Drs. Bierring and Wright, were honored.

Cleveland will be the meeting place, year 1934. Its Committee promised unusually low hotel rates, guaranteed, and also stated that wives accompanying their husbands would be charged only

\$1.00 extra per bed. This latter tempting bait evidently threw the delegates' decision for Cleveland, as against Atlantic City which is considered rather on the high-binder order.

SOME ADDITIONAL DATA

Total membership April 1, 1933, 97,111. . . . Arrangements have been made whereby delinquent Fellows may be retained on roster when they specifically indicate their intentions to remit within a reasonable time. . . . During the past year, more field work and participation of official representatives than formerly. . . . Society had to expect decreased receipts, especially from advertising; yet as stated above, owing to economies practiced by the Board of Trustees and also the fact that some income from Reserves could be utilized, helped ease the financial burden.

. . . Unusual expenses incurred through legal services in defence of suits brought against A. M. A., by certain types of irregulars, including those working the radio game and frauds.

. . . Had the price of the Journal been reduced, as urged by some members, there would have been a deficit. . . . The excess of expenditure over income from the publication of our special journals was over \$32,000. During 1932, as compared with 1931, the loss incurred in the publication of the Quarterly Cumulative Index was about \$14,000. Hygeia forges ahead in popularity and financial profit.

Interesting to note the percentage of physicians subscribing to the Journal, compared with the number of physicians in each state: New Jersey ranks first, 74 per cent; Nevada, second, 66 per cent; Rhode Island, third, 64 per cent; North Dakota, New York and Wisconsin, 63 per cent; Alabama, with 2,207 physicians, 29 per cent.

ALBERT W. SKELSEY, M.D.

DISTRICT AND COUNTY ROSTER

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Elofson, Carl E. Fargo
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Floew, A. F. Fargo

Fortney, A. C. Fargo
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Kaess, A. J. Fargo
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Lancaster, W. E. G. Fargo
Larson, G. A. Fargo
Lewis, T. H. Fargo
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Rostel, Hugo. Fargo
Rothnem, T. P. Fargo
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Swanson, J. C. Fargo
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Weible, R. E. Fargo
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 Call, A. M. Rugby
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Engesather, J. A. D. Brocket
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 Fawcett, W. C. Starkweather
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 McDonald, J. A. Cando
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 McIntosh, G. J. Devils Lake
 McLean, Neil. Devils Lake

Mattson, R. H. McVille
 Nicholson, E. G. Lawton
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 Banister, E. B. Grand Forks
 Bentzen, Olaf Grand Forks
 Benwell, H. D. Grand Forks
 Campbell, R. D. Grand Forks
 Countryman, G. L. Grafton
 Countryman, J. E. Grafton
 Deason, F. W. Grafton
 Eggers, Aug. Grand Forks
 Engstad, J. E. Grand Forks
 Field, A. B. Forest River
 Flaten, A. N. Edinburg
 French, H. E. Grand Forks

Gislason, G. J. Grand Forks
 Glaspel, C. J. Grafton
 Glaspel, G. W. Grafton
 Goehl, R. O. Grand Forks
 *Grassick, James. Grand Forks
 Halldorson, M. B., Winnipeg, Can.
 Hardy, N. A. Minto
 Healy, H. H. Grand Forks
 Hofto, J. M. Grand Forks
 Irvine, V. S. Park River
 Landry, L. H. Walhalla
 Law, H. W. F. Grand Forks
 Leigh, R. E. Grand Forks
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Mulligan, T. Grand Forks
 Mulligan, V. A. Langdon
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 O'Keefe, H. Grand Forks
 Owston, F. L. Walhalla
 Panek, A. F. Milton
 Peake, M. F. Grand Forks
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 Stromberg, G. E. Langdon
 Thompson, A. Y. Larimore
 Thorgrimsen, G. G. Grand Forks
 Tompkins, C. R. Grafton
 Vance, R. W. Northwood
 Wagar, W. D. Michigan
 Waldren, H. M., Sr. Drayton
 Weed, F. E. Park River
 Williamson, G. M. Grand Forks
 Witherstine, W. H. Grand Forks
 Woutat, H. G. Grand Forks
 Woutat, P. H. Grand Forks
 Wylie, A. R. T. Grafton

KOTANA MEDICAL SOCIETY

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AbPlanalp, Ira S. Williston
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 Hoepfer, P. G. E. Williston
 Johnson, P. O. C. Watford City

Jones, C. S. Williston
 Owenson, H. A. Arvegard
 Skovholt, H. T. Williston
 Wright, W. A. Williston

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 Gates, Russell. Minot

Goodman, Robert. Powers Lake
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 Lyman, F. V. Velva
 McCannel, A. D. Minot

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 Newlove, J. T. Minot
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 Pence, R. W. Minot
 Pierce, A. E. Minot
 Ransom, E. M. Minot
 Ray, R. IL. Garrison
 Rollefson, C. J. Crosby
 Rollie, C. O. Drake
 Rowe, P. H. Minot
 Sorenson, A. R. Minot
 Steeves, E. O. Rugby
 Timm, J. F. Makoti
 Wheelon, F. E. Minot
 Yeomans, T. N. Minot

RICHLAND COUNTY MEDICAL SOCIETY

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		Hoskins, J. H. Wahpeton	Thane, B. Wahpeton
		Ivers, M. U. Christine	

SHEYENNE VALLEY MEDICAL SOCIETY

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Promoting Preventive Mental Medicine*

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THE OBJECT of this dissertation is not to attempt a discussion of psychiatry from the viewpoint of the psychiatrist, but rather to discuss the benefits to be derived by bringing a closer co-operation between the psychiatrist and the general practitioner.

It is perhaps not to be denied that because of the failure of our medical schools to teach psychiatry, or to teach it in an engaging manner, physicians have frequently failed to see the psychiatric implications in many of their cases. There can be no doubt but that there are definable practical psychiatric problems for the examining room which can be incorporated in the history taking, examination, diagnosis and treatment of patients. Practically every case that comes before us is worthy of some consideration from the psychiatric point of view. A symptom should never be called imaginary, and we shall always be on our guard against making such a diagnosis as "neurotic" or "hysterical." The need of a closer rapport between psychiatry and general medicine must be recognized if the growing rate of admissions to our state hospitals is to be checked. It is evident, of course, that the daily association between the psychiatrist and the general practitioner must remain rather rare because of the relatively few physicians specializing in psychiatry outside the populous centers. However, this condition will perhaps be remedied to some degree by the extension of the practice of neuropsychiatry in our general hospitals.

Psychiatry is a division of medicine and, although it deals largely with deviations in personality, it is concerned with the entire organism in all its aspects, physical, mental and social. The large modern hospital has the equipment, personnel and space necessary for the study of organic neurology, endocrinology and organic psychiatric cases. It is also to be hoped that the day is coming when these hospitals will set aside equipment, personnel, time and space to study behavior problems in children; for if we are to dam the future flow of potential psychotics we must begin with the child.

In 1768 there was opened in Virginia the first hospital to be used exclusively for mental dis-

eases. Shortly following this, Franklin and his co-workers built the Pennsylvania Hospital at 8th and Spruce streets, Philadelphia, and which is still in operation. The basement of this institution was constructed for the reception and care of mental cases. Since this time there has been marked progress in the care of the mentally ill, but despite the encouraging strides made in psychiatry, and the ever increasing number of modern hospitals being erected for these patients, the number of mental cases continues to increase more rapidly than it has been possible to build institutions to care for them.

Psychiatry has progressed more in the twentieth century than in all of the other centuries together; the activities are becoming more widespread each year and many valuable investigations are constantly being conducted to improve our knowledge of this subject, as well as to prevent the tremendous toll being taken from our population each year by the ravages of mental illness. The future progress of scientific medicine, and the health and happiness of the generations to come, depend upon mental medicine. There is needed a greater co-operation between members of the profession resulting in a better understanding of psychiatry in order that posterity may benefit.

The first essential in the promotion of preventive medicine lies in a more thorough training of the medical student in this particular specialty. In the great majority of our medical colleges psychiatry is looked upon as one of the minor subjects of medicine, whereas it should be taught along with the major subjects of the curriculum, and this teaching should begin in the pre-clinic years, and should not be left to the few lectures in the final stages of the medical course. In the relationship of psychiatry to general medicine let us remember that the psychiatric examination of a patient means a study of the whole individual. The patient must be regarded as a biological whole and, therefore, the personality and the psychological reactions, as well as the physical makeup of the individual, must be understood. The general practitioner should be able to deal with the rank and file of human problems, and the tendency to avoid a case that

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appears to be in the field of the mentally abnormal should be overcome. And it can be overcome when the graduates of our medical schools are given a more general understanding of mental mechanisms and psychiatric conditions. The student should be taught psychobiology early while he is learning his anatomy and physiology. The importance of personality trends should be dealt with and demonstrated to the student at that stage. The main thing is to teach the importance of the whole personality, rather than deal with one subject after another without any correlation between them.

During the last year of the medical course it seems to me that the demonstration of the neuroses and the earliest types of mental disorder which we see frequently in the wards of the general hospital, supplemented by frequent psychiatric clinics in which the more common forms of insanity could be demonstrated, would be the ideal manner of instituting the reform we are advocating in the curriculum of all medical colleges. The training of a psychiatrist is, of course, a post-graduate problem, but the outline suggested would serve to adequately equip the general practitioner to recognize the appearance of mental disorders in their common forms.

Now let us discuss for the moment the position of the general hospital in regard to the promotion of preventive mental medicine. To mete out a comprehensive service, general hospitals must be staffed and equipped to deal intelligently with both physical and mental disorders. A study of the patient population of any general hospital at a given time will disclose the fact that a considerable proportion are afflicted with disabilities wherein both mental and physical factors are significant. Observations reveal that an appreciation of personality and environmental factors is a requisite for both diagnosis and treatment in about 50 per cent of general hospital patients. It will thus be seen that a general hospital must in a certain sense be a mental hospital as well as an institution for the cure and alleviation of physical ailments.

There have been developed in mental hospitals diagnostic and therapeutic techniques that could with advantage be utilized more widely than is the case at present in general hospital procedures. A searching inquiry concerning developmental history and an analysis of environmental forces to which the individual has been exposed are aids in diagnosis. In regard to treatment there should be mentioned occupational therapy, hydrotherapy and attention to personality factors.

During recent years psychiatric practice in

mental hospitals has emphasized the study of the genesis of mental disabilities. It has been found that an intimate knowledge of developmental history provides an understanding of psychopathologic conditions that cannot be achieved through any other means. An attempt is made to obtain a reliable account of development—intellectual, emotional, social and physical—to discover the effect of intercurrent disease upon growth, to learn the way in which critical life situations have been met. This study necessitates taking into consideration environmental factors in the home, in the school and in the workaday world. The findings can be put to good account in making a diagnosis and a prognosis and in outlining treatment.

There is a tendency in general hospital practice to make cross sectional studies of the patients and to give scant notice to genetic or developmental investigations. Even in case of conditions that are preponderantly physical in character, the study of development may be of great importance. Dr. Hincks of the National Committee for Mental Hygiene emphasized this point in regard to diseases of the heart and blood-vascular system, and he counsels us to utilize this technique in connection with all disabilities. When mental factors enter into the clinical picture the procedure of obtaining a history of development must not be neglected. Hence it seems advisable to incorporate thorough studies of antecedent and environmental history of a routine measure in all clinical general hospital practice, as is now done in mental hospitals.

Occupational therapy has proven a valuable adjunct in the treatment of mental disabilities. We have in our hospital elaborate arrangements for providing interesting work for a large number of the patient population. Activities including carpentry, printing, basketry, rug making, leather work, sewing, tailoring, brush making, furniture making, painting, shoe repairing, horticulture—indeed a multitude of crafts. A modern mental hospital presents as many features of an industrial establishment as of a hospital.

It has been discovered that work, particularly that of a type that gives opportunity for self-expression along creative lines, is a potent factor in rebuilding broken personalities, in restoring self-confidence and morale and in improving mental and physical health. Although there is perhaps need for further exploration in this field sufficient experience has been accumulated to warrant the extension of occupational therapy in mental hospital practice as well as its further use in general hospitals. It is particularly indicated

during convalescence, in the course of the treatment of chronic conditions wherein prolonged hospital residence is entailed and in connection with functional disorders. While occupational therapy can be satisfactorily employed for patients who are confined to bed as well as for ambulatory cases it would appear that in a general hospital those occupational activities more suited to bed cases should be chosen. To achieve the best results from occupational therapy in general hospitals, attending physicians should have an understanding of the indications for its use, of the particular type suited to an individual case and of the physical and psychological results that are desired. Indeed the value of this form of treatment is tremendously enhanced when reinforced by an appreciable attitude on the part of the medical staff. It is not enough for a general hospital to employ a few occupational aids and to expect them to achieve worth while results if left entirely without medical guidance.

Hydrotherapy, particularly the use of continuous baths, has provided a valuable therapeutic technique for the treatment of certain manic states wherein extreme agitation and restlessness are prominent symptoms. The use of hydrotherapy in mental hospitals has made it possible to use very few sedative and hypnotic drugs. Calming effects can thus be secured without the danger of injuring the nervous system. In toxic states accompanied by the excitement and pressure of activity and in many other conditions that frequently present themselves in general wards, hydrotherapy can be used to advantage. Every general hospital should include a continuous bath or two in its equipment.

Physicians in general hospital practice could with advantage utilize the psychiatric approach even in conditions in which abnormal mental trends are not prominent. Through this approach the patient's confidence can be won and his morale strengthened. Whether psychiatrically trained or not, the successful physician consciously or unconsciously takes into account the mental and emotional make-up of his patient. He deals one way with one type of man and another way with another. He knows when it is safe to disclose a diagnosis and when it is not. He has an understanding of what is involved in the physician-patient relationship. If these facts were more generally recognized by the medical profession at large, untold benefit would accrue to general hospital patients. Those who now flock to faith healers, quacks and practitioners who possess little scientific knowledge but considerable appreciation of human nature should be brought back

under the care of qualified physicians. If physicians utilized the psychiatric approach this end would be gained.

Much of the clinical training of medical students is given in the wards of general hospitals. The practice to which we expose student groups determine in a large measure the nature of the product of our medical schools. If attention is directed solely to physical factors we can expect the physicians of the next generation to be physically minded and unappreciative of man in relation to his environment. Such a prospect would indeed be unfortunate.

A dean of one of our great medical schools recently said medical men have been focusing attention on disease rather than on individuals who are affected with disease. They have been thinking too largely in terms of organs, of disturbances of organ systems. They have been leaving out of account attention to the emotional life, to the strivings and thwartings of the individual patient, to life situations, to factors in the home, in industry, in school and in social life that might have a significant bearing upon health. The great need for medicine is not the coming of another Pasteur, but rather the humanizing and socializing of scientific medicine. There is needed something of the outlook and attitude of the family physician of a generation ago wherein the physician knew his patients and acted as guide, philosopher and friend. A combination of the virtues of the old family physician and a keen scientific outlook should be held up as an ideal. Every physician should be a social physician. Thus the aim of emphasizing mental as well as physical factors should be kept in mind.

Psychiatrists working from mental hospital basis single-handed cannot cope effectively with the manifold and complex problems of mental disability. The concern of mental institutions is restricted for the most part to the treatment of pronounced and established mental conditions. It is true that during recent years the field of usefulness of the mental hospital has been extended by means of the organization of out-patient clinics attached to health centers, social work and educational agencies staffed by mental hospital physicians. When the mental health needs of the population as a whole are taken into account, however, it is evident that the active intelligent co-operation of the medical profession as a whole is required. Every practicing physician should be a mental hygiene missionary; he should be on the lookout for early signs of abnormal mental

(Continued on page 450.)

The Economic Importance of Tuberculosis Eradication*

Harry J. Boyts†
Sioux City, Ia.

WE ARE very appreciative of the interest and valuable work done by the veterinarians and the medical profession in the eradication of tuberculosis. The scientific research has shown the close relationship between the bovine and human types of the disease. Because of the transmissibility of bovine tuberculosis to humans greater interest has been aroused in controlling this great economic problem of the livestock industry.

Dr. Munce has just referred to the wonderful progress made during the past 10 or more years in eradicating bovine tuberculosis from our cattle and swine. The exhibit of bovine tuberculosis, showing joint, bone and gland infection in cattle and swine was prepared by the Government Meat Inspection Service at Huron and Sioux City.

In 1922 about 25 per cent of the hogs in the northern part of the Corn Belt, including eastern South Dakota and northern Iowa, were infected with tuberculosis, according to government records. Much of this disease was contracted from diseased cattle. In many counties 10 per cent of the cattle reacted to the tuberculin test, and in some counties as many as 25 to 50 per cent of the cattle were found to be tuberculous. When these reactors were slaughtered, government inspection and laboratory tests proved that the tuberculin tests were more than 95 per cent accurate. (Under controlled laboratory methods Dr. Schroeder declared the test was more than 99 per cent accurate.)

The Sioux City Market livestock was typical of the corn belt states, and for 20 years tuberculosis has been a problem here. About 15 years ago the packers tried to buy female cattle subject to postmortem, which delays the payments two weeks. Eastern order buyers of hogs either quit or discriminated against our hogs a decade ago. Cities all over the United States began protecting their milk supply 20 years ago by either Pasteurization or requiring cows to be tested supplying their milk.

To control tuberculosis in cattle the county area plan of operation was adopted by the government and the states, and the first county was

*Read before the South Dakota State Medical Association, Huron, S. D., May 16, 1933.

†Live Stock Commissioner.

accredited in 1924. Under this plan all cattle are tuberculin tested and retested. Today there are nine states fully accredited: Maine, North Carolina, Michigan, Wisconsin, Indiana, Ohio, North Dakota, Idaho and Nevada. Illinois will be accredited July 1st, and Iowa is 90 per cent completed.

In South Dakota there are only six accredited counties, however, there has been considerable herd testing. Since 1917 there have been 1,075,902 cattle tested and 17,318 reactors removed by the state and government, besides some private testing.

In order to prevent discrimination against South Dakota swine the packers at Sioux Falls, Watertown and Huron are tattooing each farmer's hogs when received, so the ownership can be identified on the killing floor. When hog carcasses are condemned or sterilized the ownership is checked and reported to the state. Then the state follows up with a personal visit to the farm. Most of the farmers are testing their cattle where generalized tuberculosis has been found in the hogs. This has resulted in the removal of several bad lots of cattle and the cleaning up of many herds.

One state manufacturer of butter has had his products turned down by Ohio cities, which restrict the sale of butter to that produced in accredited areas. This movement by the cities may cause a discrimination in butter so it will pay to test at once.

To get better information about the situation in the state a limited survey has been made to determine the extent of milk ordinances. It was found that 34 county seat towns and cities now have milk tested cows. Every city and town in South Dakota should require cows to be tested. Nebraska has such a state law. It would be very helpful to have this society pass resolutions calling upon all cities and towns of the state to protect their milk by ordinances requiring the tuberculin testing of all cows producing it.

I have a supply of a model milk ordinance for a small town or city. It is simple and workable. I also have a few pamphlets you may take if you are interested.

The Sioux City market is a good example to

show the results of tuberculosis eradication. Today the losses from tuberculosis in slaughter cattle at this market are only one-eighth what they were in 1915. The carcasses of hogs condemned and sterilized for tuberculosis are only one-sixth of 1915.

There has been an important decline in human tuberculosis other than pulmonary. This type of the disease has largely been attributed to infection from tuberculous cattle. In 1917 when the campaign of tuberculosis eradication began the death rate for tuberculosis other than pulmonary was $22\frac{1}{2}$ per 100,000 population, while in 1931 it was $7\frac{1}{2}$ per 100,000. In our territory these results have been substantiated by Dr. Arch O'Donoghue, orthopedic surgeon, of Sioux City, who says: "Bone and joint tuberculosis in children is markedly on the decline. We are seeing three to four times as many patients as we did six to eight years ago, but we are not seeing nearly as much joint and bone tuberculosis as we were in a much smaller volume of work."

PROMOTING PREVENTIVE MENTAL MEDICINE

(Continued from page 446.)

development and ready to provide scientific assistance.

Closer co-operation between general hospitals and mental institutions will hasten the day when medicine in general will conceive its function to be that of assisting man to adjust himself effectively to a dynamic environment. Attention will be directed to the physical organism and its processes, not as an end in itself but in relation to the adjustment of the total organisms. The futility of divorcing the mental from the physical will become clearly recognized. Indeed, these terms may be expected to disappear when the medical man approaches all cases psychobiologically. Leaders in medicine and leaders in psychiatry should work toward this end.

The advisability of the establishment of a psychopathic hospital in our state has been under discussion for several years, but economic factors have deterred the promotion of any active efforts in this direction. However, I am firmly of the opinion that when our state is in a position financially to do so this institution should come into being. A psychopathic institution would

occupy a place midway between the general hospitals of the state and the present state hospital for the insane. In the establishment of such an institution the physicians of the state would then have a place where they could send their nervous and mentally ill patients for observation and care without the necessity of legal commitment to the state hospital, and thus avoid the stigma that invariably follows the process of declaring a patient insane. Upon being sent to this psychopathic ward by the family physician the patient would be treated and also be under observation there, and in a large number of instances recovery would follow in due time and the patient returned to his home. If in the course of the observation of any given case in the psychopathic ward it was found that the case was one for prolonged treatment in our state hospital, the transfer could be made in the usual legal manner.

The system of waiting until a person shows a definite manifestation of a mental breakdown is a violation of scientific and humane principles, and should be avoided. Investigation of the case and the institution of appropriate means of care and treatment are delayed too long. Early recognition of the coming of mental trouble is necessary to prevent the case from becoming chronic. The establishment of a psychopathic hospital would attain this end. Proper treatment could be instituted early and no one would be pronounced insane until the case had proven to be incurable. The psychopathic ward would serve to establish a system under which a mentally ill person could be treated in the initial stages of the disorder as a sick and not as an insane person.

While progress has been made in breaking down public prejudice concerning abnormal mental states yet the unfortunate notion still obtains. The idea that mental illness is a disgrace, and that diseases of the mind cannot be considered in the same light as disabilities of the body is perhaps slowly disappearing, but there is still a long time required to entirely dissipate the feeling. However, when and if we have our psychopathic ward, and when physicians in general hospital practice become interested in mental phenomena, and with facilities for the observation and treatment of those who have mental as well as physical problems, the last vestige of public antipathy may be expected to disappear.

The JOURNAL LANCET

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MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
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' Assn.
Great Northern Railway Surgeons' Assn.
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MINNEAPOLIS, MINN., AUGUST 15, 1933

TRENCH MOUTH

Now that halitosis has become a household word and lost its novelty, trench mouth has taken its place as a popular subject of discussion.

The how, why and whence of the present epidemic does not call so much for a study in bacteriology as it does of sociology. The nature of the infection is well known but why is it so prevalent at the present time? The war-time name is of no significance.

Perhaps the observing eye will find an answer in the present promiscuity of direct and indirect kissing. The hip flask and the "loving cup" are passed around as a gesture of common friendliness and cigarettes are lighted for all, by the one sitting nearest the lighter.

Not only trench mouth but many other infections enter by this same door. We have had anti-spitting crusades; why not an anti-kissing crusade?
A. E. H.

PITFALLS OF SPECIALISM

We have a way of saying tritely that this is an age of specialists and letting it go at that, as if it were a settled fact, with nothing to do about it.

It is true, we must admit, that with increased accumulations of knowledge and experience the various branches of medicine and surgery have become so replete that the average professional mind is incapable of assimilating and practicing

expertly more than one of them. Hence the specialist.

Unfortunately, the workings of the human body have not lent themselves well to this arrangement. Every important function is so correlated to others that there can be no absolute limitations of specialties. The orthopedist is confronted with deformities due to the paralyzes, in the field of the neurologist. The eye man looks in the fundus and sees kidney diseases or arteriolar sclerosis. The surgeon, unfamiliar with non-surgical diseases, may mistake tabes with its girdle-pains or coronary disease with its radiating angina for acute organic abdominal lesions. Purely medical diseases, like typhoid, lobar pneumonia or diabetes may become purely surgical with perforation, empyema or gangrene.

It is this overlapping of the fields on which specialties are based that constitutes these greatest pitfalls. The self sufficient specialist who is unfamiliar or loses touch with other branches is certainly not the safest type and may be definitely dangerous.

After all, the best approach to any specialty is a few years' experience in general practice. It is a gruesome grind to a man who wants to think only in terms of astrocytomas or inverted T-waves but it will make a better medical citizen of him in the long run.

G. C.

EVILS OF SAMPLE PEDDLING

A detail man recently said, as he laid down some tiny samples: "the object of a sample is just one thing—to acquaint the physician with the product. It is not to be handed out to patients with the label on," and every thinking physician subscribes wholeheartedly to that statement.

It is difficult to estimate the amount of subsequent self-medication and therapeutic error that this practice of passing on of samples is responsible for. The physician gives out the sample with the best of intentions. First, let us say, it fits the case in hand; he has recently been impressed with its worth. Second, it is convenient. Third, he is doing the patient a favor by giving him something that he would otherwise have to buy and pay for. The last of these seems most commendable, but for the fact that the majority so favored appear later to afford its market price. The patient, having learned the doctor's secret goes directly to a druggist for his medication. He has turned the tables on the doctor, paying for his medicine but not for his advice.

A. E. H.

QUALIFIED HUMANS SHOULD BE REGISTERED

All over this fair land, whether it be in the well informed and populous commonwealth of Massachusetts, the majestic and eugenic states of the middle west or the exuberant and hyperbolic state of California, human offspring is still the product of more or less accidentally united parenthood.

Blood and breeding is beginning to receive some thoughtful consideration although it may be said that it is scarcely out of the early discussion stage. It used to be a favorite topic at farmers' institutes and county fairs. And now that horses, cows, hogs, dogs and fowl have had their inning, attention is being turned to the needs of a standard of quality and respectability in the human race whose procreation heretofore has been more a matter of chance than the result of intelligent mating.

Something has been done to determine the intelligence quotient of those who have been suspected of mental deficiency and in some cases of those entering upon some special course of training. Physical examinations are a part of the entrance requirements of many schools and

a pre-requisite in most cases where life insurance is applied for. Something has been done, yes, but how insignificant in comparison to that which has set up a pedigreed aristocracy among many of the lower animals.

As long as the rights of the individual are held so sacred, and we have no universal check on his purity or taint, there can be little hope of diminishing transmissible degeneracy and reducing crime. Society must lay sentiment aside and prescribe requirements of eligibility for those who would get married, and the family tree should be accessible for inspection before the contracting parties have "crossed the Rubicon."

A. E. H.

ANATOMY VIVIFIED

From early times efforts have been made to "dress up" the cold, bare facts of anatomy with a view to making them attractive and interesting. Vesalius employed a pupil of Titian to make the illustrations for his "De Fabrica" so that the craft of the artist might instil the appearance of action and beauty into the reproductions of the dissections. The lure of the cinema and of the stereoscope has been utilized for this purpose and the skill of the modeler and of the painter has done its part. Most of this trend has been directed toward the entertainment of the eye, however, and very little effort has been made to weave the fundamental facts themselves into a narrative of equal interest.

In a book recently published* we have an excellent example of a new departure in the presentation of anatomical data with original illustrations. It is as fascinating to read as a book of adventure and the pictures, mostly diagrams at that, are highly clarifying. Our contemporary, the British Journal of Surgery, departs from its usual atmosphere of reserve to say "In the variety of its subject matter and the cleverness of its illustrations it intrigues us, and we feel quite the excitement of turning over the pages of the latest thriller to see what the next chapter is going to be."

Those who have found the study of anatomy dry and uninteresting should get this book and read it. They will experience a happy surprise.

*Synopsis of Surgical Anatomy, by Alexander Lee McGregor, M.Ch. (Edin.), F.R.C.S. (Eng.), Lecturer on Surgical Anatomy, University of Witwatersrand, etc.; with a foreword by Sir Harold T. Stiles, K.B.E., F.R.C.S. (Edin.). Pp. 609 + XVI, with 606 illustrations. 1932, New York, William Wood & Co.

G. C.

25 YEARS AGO
from JOURNAL-LANCET

Dr. Syver Vinje now located at Hillsboro, N. D., was doing post-graduate work in Chicago.



The Northwestern Life Insurance Company of Minneapolis adopted a uniform fee of five dollars for examinations made for the Company.



Dr. Edward L. Fortier now located at Little Falls, Minn., moved to Lidgerwood, N. D., where he became associated with Dr. N. J. Shields.



Contracts were let by the Fairview Hospital Association for the construction of a new hospital to cost \$150,000 and to be erected at Twenty-third Avenue South and Sixth Street, Minneapolis.



Dr. J. W. Bell, Professor of Clinical Medicine at the University of Minnesota, read a paper, "Home Treatment of Pulmonary Tuberculosis," before the Upper Mississippi Valley Medical Society.



The Black Hills Medical Association met at Ft. Meade and were entertained by Major Klup. Cases and papers were presented by the following Doctors: J. W. Freeman, W. G. Smith, and F. E. Walker.



Dr. W. A. Jones, Professor of Nervous and Mental Diseases at the University of Minnesota, recently read a paper "Diseases of the Cerebral Vessels, With Its Problem in Diagnosis," before the American Medical Association meeting in Chicago.



The courts of North Dakota returned a decision making it a violation for doctors in that state to sell, without a license, any intoxicants either as a beverage or medicine. They may, however, administer an intoxicant without violating the law. But the law does not permit a doctor to accept a fee for such administration.



At the annual meeting of the Grand Forks Medical Association the following doctors were elected officers for the current year: President, Henry O'Keefe, M.D., Grand Forks; Vice-President, E. J. Countryman, M.D., Grafton; Secretary, A. L. McDonald, M.D., Grand Forks; Delegates, W. H. Witherstine and Zella Stewart, Grand Forks.

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. C. A. Homan, a former resident of Aberdeen, S. D., died recently at his home in Arizona.

Dr. G. E. Olson, a recent graduate of the University of Minnesota, has opened offices for general practice at West Concord, Minn.

Dr. A. E. Bostrom, who recently retired as a member of the state board of health, will resume active practice again at his home city, De Smet, N. D.

Dr. W. F. Keller, Sioux Falls, has been appointed state prison physician, and succeeds Dr. H. J. Day, who will now return to his private practice.

Dr. C. A. Platou, Valley City and Miss Inga Rocksvold of Litchfield, N. D., were united in marriage at a quiet ceremony at the brides home last month.

Dr. Sherrill, a graduate of the University of Nebraska, has become associated with Dr. J. H. Davis in the practice of medicine and surgery at Belle Fourche, N. D.

The Southern Minnesota Medical Association will hold the annual meeting September 25, at New Ulm, as guests of the Redwood-Brown County Medical Society.

Dr. H. R. Rice, Badger, Minn., has moved to Shakopee, Minn., where he has joined Dr. P. M. Fisher as a partner. Dr. Rice is a Minnesota Graduate of the University.

Dr. J. C. Fawcett, Devils Lake, was recently married to Miss Clara E. Schrag, of Starkweather, N. D. The wedding took place at the home of the brides mother, many outside guests being present.

The members of the Upper Mississippi Valley Medical Society held their summer meeting at International Falls, Minn., with Drs. R. E. Scammon and H. I. Dunn, of the University of Minnesota, as guest speakers.

Dr. C. R. Dukart, a recent graduate of Creighton University, Omaha, will open offices for general practice at Hankinson, N. D. Dr. Dukart was born at Hankinson, and has a wide acquaintance in that section of the state.

Dr. A. E. Booth, Minneapolis, is in Europe this month where he will attend the International Gorter Conference at Berne, Switzerland. Dr. Booth is a delegate from the Hennepin County Medical Society, and the American Gorter Association.

At the semi-annual meeting of the Clay-Becker Medical Society held at the Sand Beach Sanatorium last month, brought out a large attendance. Dr. C. D. Wright, Minneapolis, spoke on "Cardiac Diseases" and Dr. N. O. Pierce, Minneapolis, presented a paper on "Medical Economies."

The Kingsbury County Medical Society, held their annual picnic at Lake Preston, S. D., on July 27. The doctors bringing their families, made it a very enjoyable afternoon, and after refreshments were served, the doctors discussed professional topics.

Members of the Montana State Medical association will take an active part in the dissemination of general information about cancer, in connection with the appointment of a state committee of doctors who will have charge of the cancer work program.

Drs. W. J. Mayo, Rochester, and Guy Stanton Ford, LL.D., dean of the graduate school, University of Minnesota, were honored by testimonial awards by the Minnesota chapter of Sigma Xi at the annual meeting. Samuel C. Lind, Ph.D., Minneapolis, was elected president of the chapter.

Dr. A. F. Kilbourne, head of the Minnesota State Hospital for the insane at Rochester, has recently undergone a serious surgical operation, from which he is making rapid recovery despite his seventy-three years. In 1934 he will complete a half century of service for the people of Minnesota.

A new North Dakota board of health was formed recently by the appointment of three members by Governor William Langer. Those named were Dr. N. B. Livingston, Minot, two year term; Dr. Agnes D. Stucke, Garrison, four year term; and Dr. John Crawford, New Rockford, six year term.

The Minnesota State Medical Association broadcasts weekly at 11:30 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint 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 this month will be

as follows: August 16, "Getting Ready for School;" August 23, "Treatment of Varicose Veins;" August 30, "Tumors of the Prostate."

Judgment was entered in the District Court of Ramsey County against the Pioneer Mutual Health and Benefit Insurance Company, as follows: "*It is hereby adjudged and decreed* that the charter, liberties, privileges and franchise of said corporation, be and the same hereby are forfeited to the State of Minnesota, and the existence of said corporation is hereby annulled." This corporation was organized by lay people early in 1933, for the purpose of "maintaining a health service or insurance." Medical, surgical and dental services were to be supplied to policy holders for \$1.50 per month. Quo warranto proceedings were instituted by the Attorney General to dissolve the charter of this corporation. The Court held the acts to be unlawful, but a stay of forty days was granted to permit the defendant corporation to appeal to the Supreme Court of Minnesota. The time for taking the appeal having expired and no appeal being taken, judgment was accordingly entered, and a certified copy of that judgment has been served upon the Secretary of State, terminating the existence of this corporation.

John Stramer was arrested at New Ulm, on a charge of peddling without a license. He is an itinerant vender of a preparation called "Trunox," which preparation is being recommended for the treatment of arthritis, liver, kidney and stomach trouble. Stramer entered a plea of guilty before a justice of peace and was fined \$60.00 and costs. Upon the payment of the fine and costs he was ordered to leave the State of Minnesota. The investigation made discloses that this man is driving a 1928 Chrysler with a Washington State license. He is accompanied by his wife and two children, both girls, five and nine years of age. Stramer, according to his own admission, has been charging up to \$200 for treating arthritis. He claims to have come to Minnesota from Pasco, Washington. He admits having treated patients in the neighborhood of Sauk Center, Becker and Dayton. If Stramer is seen anywhere in the State of Minnesota, please notify the State Board of Medical Examiners at 524 Lowry Medical Arts Bldg., St. Paul, Minn. Stramer's correct name is Gerhard John Stramer, but he goes by the name of Jack.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD
OF MEDICAL EXAMINERS, JULY 25, 1933

BY EXAMINATION

(June)

Name	School of Graduation	Address
Baker, Charles Preston	U. of Nebr., M.D., 1930	824 W. Center St., Rochester, Minn.
Benjamin, Harold Garner	U. of Minn., M.B., 1933	2222 Blaisdell Ave., Minneapolis, Minn.
Bergen, Charles Thomas	U. of Minn., M.B., 1932, M.D., 1933	309 Court Lane, Albert Lea, Minn.
Boline, Clifford A.	U. of Minn., M.B., 1932, M.D., 1933	Henning, Minn.
Edwards, Thomas Jefferson	Tulane Univ., M.D., 1931	515 Delaware St., Minneapolis, Minn.
Eklund, Carl Milton	U. of Minn., M.B., 1932	29 Sidney Place, Minneapolis, Minn.
Erickson, George T.	U. of Minn., M.B., 1932, M.D., 1933	412 Main St., Hackensack, N. J.
Faber, John Edwin	U. of Wis., M.D., 1932	Miller Hospital, St. Paul, Minn.
Griffin, Albert Miles	Northwestern U., M.B., 1932, M.D., 1932	Mayo Clinic, Rochester, Minn.
Hanson, C. Gustav	U. of Minn., M.B., 1933, M.D., 1933	412 Main St., Hackensack, N. J.
Hanson, Malcolm Bertram	U. of Cincinnati, M.D., 1925	1953 Medical Arts Bldg., Minneapolis, Minn.
Hartung, Elmer Herman	U. of Minn., M.B., 1932, M.D., 1933	1659 E. 7th St., St. Paul, Minn.
Hebbel, Robert	U. of Minn., M.B., 1932	Windom, Minn.
Hoff, Herbert Orland	U. of Minn., M.B., 1932	1223 Selby Ave., St. Paul, Minn.
Hopkins, George Wendell	U. of Minn., M.B., 1932, M.D., 1933	1513 W. Minnehaha, St. Paul, Minn.
Kroeze, Robert Gray	Johns Hopkins, M.D., 1931	824 1st St. N. W., Rochester, Minn.
Kucera, Stanley Thomas	Creighton U., M.D., 1933	Montgomery, Minn.
McGregor, Catherine	U. of Minn., M.B., 1932, M.D., 1933	3120 Portland Ave., Minneapolis, Minn.
Manning, Walter Philippe	U. of Minn., M.B., 1932, M.D., 1933	90 W. Minnehaha Parkway, Minne- apolis, Minn.
Mason, Paul Bernard	Northwestern, M.B., 1931, M.D., 1932	15 12th Ave. N. W., Rochester, Minn.
Ness, Claire Marie	U. of Minn., M.B., 1931, M.D., 1932	5225 3rd Ave. S., Minneapolis, Minn.
O'Hanlon, John Anthony	Marquette U., M.D., 1933	3340 1st Ave. S., Minneapolis, Minn.
Peters, Joseph Frank	U. of Minn., M.B., 1933	717 5th St. S. E., Minneapolis, Minn.
Peterson, Leonard Theo.	U. of Minn., M.B., 1931, M.D., 1932	Fort Hancock, N. J.
Pilcher, Frederick, Jr.	U. of Virginia, M.D., 1929	Mayo Clinic, Rochester, Minn.
Robbins, Owen Francis	U. of Minn., M.B., 1931	Minneapolis General Hospital, Minne- apolis, Minn.
Schmidt, Herbert William	U. of Minn., M.B., 1932, M.D., 1933	c/o E. W. Schmidt, Northfield, Minn.
Spurzem, Clementine Helen	U. of Minn., M.B., 1933	1501 James Ave. N., Minneapolis, Minn.
Stewart, Charles Duncan	U. of Minn., M.B., 1932, M.D., 1933	St. Luke's Hospital, Duluth, Minn.
Stolpestad, Armer Harold	U. of Minn., M.B., 1933	852 Mound St., St. Paul, Minn.
Stransky, Theodore Wm.	U. of Minn., M.B., 1932	Owatonna, Minn.
Wesson, Harrison R.	U. of Virginia, M.D., 1929	Mayo Clinic, Rochester, Minn.
Wherry, Franklin Priest	Ohio State U., M.D., 1930	Mayo Clinic, Rochester, Minn.
Wolkoff, Hyman Joseph	U. of Minn., M.B., 1932	93 N. Milton St., St. Paul, Minn.
Young, Cuthbert Ben	U. of Minn., M.B., 1933	1828 Columbus Ave., Minneapolis, Minn.
Zellhoefer, Howard Wm. Karl	Harvard U., M.D., 1931	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Nygren, William Theo.	U. of Nebr., M.D., 1932	Braham, Minn.
Watson, Bernard Alec	U. of Mich., M.D., 1929	3450 Portland Ave., Minneapolis, Minn.

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Arey, Stuart Lane	U. of Minn., M.B., 1931, M.D., 1932	Excelsior, Minn.
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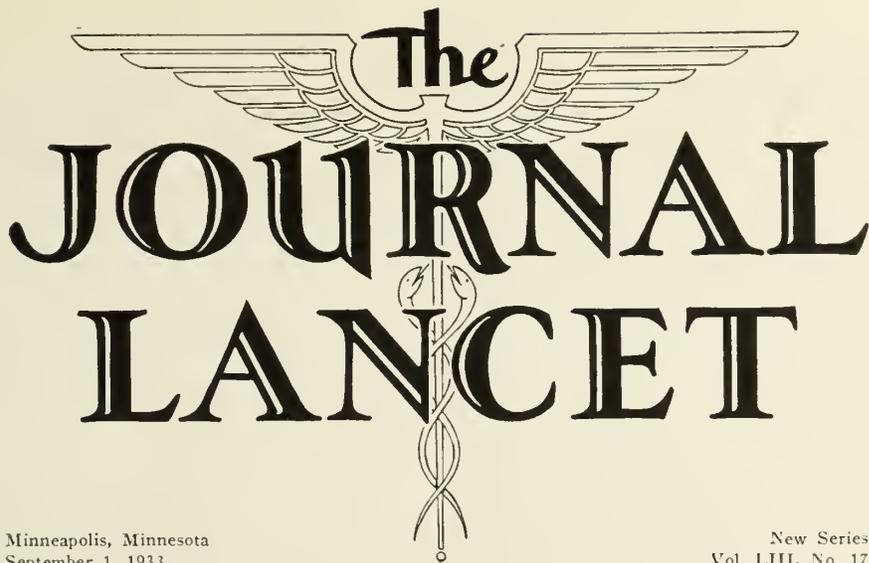
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Some Drastic Changes in Our Conceptions of Tuberculosis*

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Minneapolis

FOR about twelve years I have had the opportunity of studying serially the chests of infants, children and young adults, through the Lymanhurst School for Tuberculous Children, the Students Health Service at the University of Minnesota, and elsewhere. The infants seen in the beginning of this work are now more than twelve years old, while those who were in the teen ages are now twenty-five to thirty-one years old. Thus, through this period of years, I have been able to observe lesions in the same chests in infancy and the teens and twenties, when tuberculosis is very destructive, as well as in the period of three to twelve years, when it causes relatively few deaths and little disability.

The observations of the past twelve years have completely changed my views concerning tuberculosis. Indeed, the fatalistic viewpoint of twelve years ago has been changed into a very optimistic one. In this paper I shall present some of the old viewpoints, contrast them with the present, and give some of the evidence which forced the change of viewpoint.

First, I believed with most workers of that time that the infant has little resistance to tuberculosis. As observations were made, year by year, there appeared very definite evidence that the infant has an unusually high resistance to the first attack by this disease.¹ A fact known even then and

which should have nullified the previous opinion was that from various parts of the world large numbers of infants and young children had been reported positive to the tuberculin test without any other evidence of disease. This in itself was good proof that the infant has a high resistance to the first infection type of tuberculosis. Moreover, pathologists had seen a large number of tuberculous foci in the bodies of children who had never been ill from tuberculosis and who died from other causes. In addition, Krause² had shown that baby animals are as resistant as adults of the same species when proportionate doses of bacilli are administered.

The facts obtained from the tuberculin test, the postmortem findings and our longitudinal study of tuberculosis^{1 3 4 5} in the bodies of the same infants and children, have shown that the infant has a high resistance to tuberculosis because the vast majority who become infected with tubercle bacilli develop tubercles but control their disease of the first infection type. I have not yet seen an infant or child die of the first infection type of tuberculosis per se. The few who have died have had first infection type of disease, which rendered them allergic, and in my opinion re-infection from exogenous or endogenous sources was the cause of death. In the literature there are reports of infants and young adults dying of what is described as first infection but to my knowledge none of these cases had periodic tuberculin tests to determine when they became

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allergic; nor was there any adequate control over the number of exposures and size of the dosages of tubercle bacilli. Moreover, in most of them there was no way of determining whether bacilli were accidentally released from the first infection lesions on allergic tissue, thus causing the re-infection type of disease which resulted in death.

A *second* opinion to which I clung very firmly was that there is a sharp dividing line between tuberculous infection and tuberculous disease. As observations were made on children at Lymanhurst and elsewhere, flaws in that opinion became evident. We previously had thought of disease as a condition causing loss of our sense of well being. Unless a lesion could be found by our crude methods of examination, and symptoms were present, we did not consider that the individual had disease. We had ignored the fact that by the fine disease screen, the postmortem examination, the pathologist had reported tuberculous disease in people who had been examined physically and even X-ray, but in whom no tuberculosis was detected, and who never had symptoms of tuberculosis. The truth is, we were ignoring the beginning of the disease and labeling it only after considerable destruction had occurred. From experimental and clinical observations, I have been compelled to disregard any dividing line between what we formerly called tuberculous infection and tuberculous disease, and to conclude that a typical positive tuberculin reaction indicates a focus of tuberculosis in the majority of cases and to attribute the subsequent findings and developments in each case to the type and extent of disease: accidents, such as rupture of foci of disease; exogenous re-infection; et cetera.

The *third* opinion was that a positive tuberculin reaction in the absence of symptoms of disease, which was then called tuberculous infection, indicated protection against tuberculosis. As observations on infected children were continued, however, the clinical pictures which appeared were unexplainable on the basis of the old theories and beliefs.

These clinical pictures usually made their appearance in the teens and twenties and almost without exception in the bodies of those who had previously reacted positively to tuberculin.^{6 7} Some had old first infection types of tuberculosis, demonstrable by X-ray film examination; others had clear chests as far as the X-ray film was concerned. I have been compelled to accept clinical pictures; there is no way to avoid them. These pictures have been sufficiently numerous to cause a complete reversal of the third opinion, namely, that the condition which results in a positive

tuberculin reaction is a sufficient protection.⁵ I now feel that primary infection is detrimental rather than beneficial, and thoroughly agree with Pindell⁹ when he says: "It has been said that a person is most unfortunate who has never had a tuberculous infection. I prefer to be one of the unfortunates." The absurdity of the previous opinion is now clearly seen. The tuberculin reaction is caused by allergy and gives us no measure of immunity. Allergy has been recognized as a dangerous element in tuberculosis^{10 11} and is most commonly caused in nature by tubercle formation.

The nature of the tubercle bacillus is such that it remains alive in the primary complex over long periods of time. In some primary foci, sufficiently large to be demonstrated during life, caseation occurs. This is also true of the disease in the regional lymph nodes. Frequently calcium salts are deposited in the caseous material. In 25 to 35 per cent of such cases, true bone forms in the capsule surrounding the caseous material. Since complete absorption of both calcium and bone may later occur,¹² the tubercle bacilli are not as permanently walled off as we once believed.

Likewise, the fact that the human body has such a strong inherent resistance to tuberculosis, that it usually brings under control the foci of first infection, does not necessarily mean that these foci will always remain under control. The tissues of the body containing them are often dangerously allergic; thus, great harm may result when tubercle bacilli escape from the primary foci.

From these original foci, the caseous material may rupture into one of the large lymphatic ducts or directly into a blood vessel, supplying the blood stream with tubercle bacilli. If large numbers of bacilli are thus fed to the blood stream, they are carried to various parts of the body, where they find lodgment on allergic soil, thus setting up areas of acute inflammation which, if too numerous, take the life of the individual in a short time, through a condition known as miliary tuberculosis. This may occur at any time in life following the development of allergy. Again, the caseous material may rupture into the pleural cavity or the pericardial cavity, setting up tuberculous pleuritis or pericarditis. Not all primary foci are in the chest. They may be so located that the tubercle bacilli find their way into the peritoneal cavity, resulting in tuberculous peritonitis or into the ventricles of the brain, or directly into the subarachnoid space, thus resulting in tuberculous meningitis.

Bacilli from the primary foci may be ingested

by phagocytes and carried to remote parts of the body, such as the bones, the joints, and the kidneys, where finding lodgment in allergic tissues, they set up destructive lesions. The fact is well established that bacilli may find their way into air passages through the rupture of caseous material from the primary foci and that such bacilli may be aspirated into the ramifications of the bronchial tree and thus find lodgment on allergic soil. Here at first an acute inflammation is set up which results in fixing them in their new locations, where frequently they continue to multiply, and the products of growth, particularly the protein fraction, to which the tissues are hypersensitive, result in necrosis of adjacent tissues. At the same time there is proliferation of the connective tissue cells, resulting in fibrosis. In due time, the necrotic tissue finds its way into a ramification of a bronchus, and the space it formerly occupied we designate as pulmonary cavity. The re-infection type of tuberculosis, acute or chronic, may make its appearance at any time in life after the first infection type is well established and allergy has developed. Thus, we see re-infection tuberculosis from infancy to senility. The age periods of greatest prevalence, however, are from fifteen to forty years and from fifty through senility. The tendency, therefore, is for the disease to progress, although all must admit that many lesions of re-infection come under control, as evidenced by clinical observation and postmortem examination. Thus, meningitis, miliary tuberculosis, pleuritis, pericarditis, peritonitis, chronic pulmonary disease, or any other of the destructive forms of tuberculosis, may result at any time in life from the foci of first infection.

Therefore, I can no longer look upon the condition of tubercle formation, which results from the first infection type of tuberculosis, and causes allergy, as adequate protection to the body. Some immunity may be developed, but as long as allergy is present, the immunity is of little avail in protecting us against such disasters as those cited above. Pindell⁹ says: "There does occur a form of immunity in tuberculosis, but I am convinced that it is only transient and relative." Moreover, I am forced to agree with Peterson¹³ who says: "Freedom from clinical tuberculosis depends on natural resistance and not on the immunity. There appears to be no escape from this conclusion despite the recent work of Calmette." With such facts now available, we cannot say "the expensive isolation of patients in hospitals, the costly education of the public, and the millions spent in tuberculin testing and

in compensation of the owners for animals slaughtered, have been of no avail."¹⁴

Tubercle bacilli produce two distinct reactions in the human body. When they first enter and become lodged in the tissues they are met by a very strong inherent resistance. Apparently, it is because of this resistance that the first infection type of tuberculosis is so benign. During the course of the development of this type of disease, however, the tissues become allergic or hypersensitive to the protein contents of tubercle bacilli. After allergy makes its appearance, the human body reacts in an entirely different manner when tubercle bacilli come in contact with the tissues. Inasmuch as the first infection type of disease must be present to produce allergy, the type which develops after allergy is established is known as the re-infection type. Therefore, the re-infection type of tuberculosis may be due to tubercle bacilli which escape from foci of the first infection type and find lodgment on allergic tissues. This we call endogenous re-infection. Some prefer to speak of this as dissemination of bacilli from the primary complex and look upon it as a continuation of the primary disease regardless of when it occurs. Again tubercle bacilli from outside sources may be taken into the body where, falling upon allergic tissues, re-infection type of tuberculosis develops. This we call exogenous re-infection.¹⁵ What percentage of destructive, chronic, tuberculosis of the lungs is due to exogenous re-infection, no one knows. Some argue that it never occurs; others that it is the common cause of destructive pulmonary tuberculosis. Still others are of the opinion that about one-half of such cases are due to exogenous re-infection. To determine whether re-infection is from an endogenous or an exogenous source is a very difficult problem, because of the uncontrolled factors which influence the situation. In my opinion, both sources of re-infection are important. The best solution of tuberculosis control, therefore, appears to be in preventing the first infection type; that is, not allowing cultures of tubercle bacilli to be planted in the body, since upon this foundation all the possibilities of future destruction from tuberculosis must be built.

The tuberculin reaction is a test for allergy. After bacilli find lodgment for the first time, there is no way of detecting their presence until this test becomes positive, which usually is a matter of a few weeks (pre-allergic stage). Krause¹⁰ says: "Accordingly, the allergic reaction is seen to be responsible for all the acute manifestations of tuberculosis, and when so con-

sidered it must be viewed as a potent contributor to pathogenesis. Human beings pass as perfectly well as long as they hold their tuberculous infections asymptomatic, inactive. But they are allergic; and any discharge of sufficient focal material to a new place will render them immediately ill because of the allergic reaction that ensues promptly." Therefore, our dangers from tuberculosis really begin when allergy makes its appearance and remain as long as allergy is present. We can not plant cultures of tubercle bacilli in the bodies of infants, children, and adults without producing allergy, which is sure to be followed by considerable disability and destruction. Some argue that there must be a protective dose of tubercle bacilli; but apparently any dose that is large enough to produce allergy, as indicated by a positive tuberculin reaction, is dangerous, because of the possibility of multiplication of the tubercle bacilli within the body, so the dose administered today might be many times that size in a few weeks or years.

The *fourth* opinion which I held twelve years ago was that the individual who might pass through infancy and childhood without reacting positively to the tuberculin test, that is, without having received the so-called protective tuberculous infection, but who was exposed in adult life, would most likely die of a rapidly progressive consumption. It is true that a great many people in the teen ages and early twenties at that time died of such disease, but inasmuch as no periodic tuberculin tests or X-ray film examinations had been made in these cases, no one was certain of what the tuberculosis history had been. Whatever, was said about them was purely a matter of opinion, the only established fact being that they died of extensive tuberculosis. As some of our Lymanhurst children grew into adult life and fell ill from the destructive types of tuberculosis, their previous histories were among our records and the overwhelming majority of them were not the children who had been negative to tuberculin until a short time before they fell ill.³ The extensive study of tuberculosis in South African natives by the South African Institute for Medical Research¹⁶ showed that approximately twice the percentage of the native boys who were positive to tuberculin when they were employed in the gold mines fell ill from tuberculosis as those who reacted negatively to tuberculin. This is in agreement with our observations on Minnesota children and young adults. Pope¹⁷ observed that only one-half as many children with suspected tuberculous lesions of the first infection type later broke

down from the re-infection type of disease as those who had demonstrable first infection type of disease when first examined.

The question then arose as to what does actually happen to young adults, who have repeatedly been negative to the tuberculin test, and how do they react when first exposed? Some of these cases were seen at Lymanhurst and very much to our surprise they developed the same benign type of tuberculosis as our infants and children. In 1927, Dr. Ivar Sivertsen, having just returned from Europe, informed me of the work which Dr. Johannes Heimbeck had in progress at the Ullevål Hospital in Oslo, and suggested that similar studies be undertaken in this country. Heimbeck's work consisted of administering tuberculin tests to all the students entering the school of nursing. He had found that only approximately 50 per cent reacted positively to tuberculin on admission, but not long after completing their tuberculosis service 100 per cent were positive. Heimbeck was also making a study of the types of lesions these girls, previously negative to tuberculin, developed following infection. Immediately, opportunities were sought to undertake similar studies in Minnesota.

In the fall of 1928, the Students Health Service at the University of Minnesota, administered tuberculin tests to the entering students.¹⁸ Instead of 95 per cent reacting positively, as we had previously supposed, only about 35 per cent were positive. This percentage has been found to obtain also among the freshmen students at the University of Wisconsin. In the schools of nursing of the private hospitals of Minneapolis less than 30 per cent of the probationers reacted positively on entrance to the schools. In one school in the fall of 1932, every probationer was negative to a full milligram of tuberculin when she enrolled. Obviously, the number of young adults who react positively in any community will depend upon previous exposure. Where good control measures have been in practice sufficiently long, the incidence of infection has already become very low. For example, the figures available in Iowa indicate that only about 16 per cent of young adults react positively. One finds in communities where few control measures have been in practice, the incidence is very high. For example, in certain sections of Philadelphia, Hertherington et al.¹⁹ have found more than 90 per cent infected at the age of eighteen years. This figure is not much different than that found by the early workers in the old European cities, such as Vienna. There is evidence that the incidence of positive reactors

is definitely decreasing in those parts of the country where good preventive work has been practiced. For example, ten years after the Framingham Demonstration, Chadwick and Zacks²⁰ found the incidence of positive reactors of corresponding ages had decreased about 24 per cent. Pindell⁹ has recently called attention to the fact that in Los Angeles County children averaging about ten years, the incidence of positive reactors is about 16 per cent, whereas, five years ago it was almost twice that high. Actual tests administered to high school students in the city of Chicago is revealing the fact that only approximately 38 per cent are reacting positively. Therefore, the old figures we have so long quoted have become obsolete. A new condition has developed through isolation, treatment, and instruction of human cases and through pasteurization of milk, area testing, and slaughter of animal cases of tuberculosis.

Thus, an unusual opportunity presented itself to observe 70 per cent of the students entering the University of Minnesota, and more than 70 per cent of the students entering schools of nursing in private hospitals, with reference to the increase in the incidence of positive reactors and the type of disease they develop if they become infected. As our students of medicine and nursing came in contact with tuberculous patients, periodic tests were administered to those who had previously reacted negatively, and large numbers of them presented marked reactions, indicating a high degree of allergy. This test was found to be the earliest diagnostic agent in tuberculosis, for without exception it became positive weeks and months before there was any other evidence of the disease: such as symptoms, physical signs, and X-ray findings; in fact, in many of them the locations of the lesions have not been demonstrated to date.^{21,22} This is in agreement with other observers, as well as our previous observations, showing that even the stereoscopic X-ray films aid in detecting primary foci only in 15 to 25 per cent of the positive reactors. In those who eventually developed demonstrable lesions of first infection in the lung, there was a period of time after the test became positive before sufficient change occurred to cast an X-ray shadow visible on the film. When the lesions finally became large enough to cast visible shadows, they appeared approximately the same as first infection types of lesions I had so frequently seen in children.²³ Symptoms were absent except in the occasional case, who developed such conditions as erythema nodosum and pleurisy with effusion, and even these students

apparently were in excellent health as soon as the erythema or effusion disappeared. In fact, their pulmonary lesions usually were detected simply because we were periodically examining for them. As time passed, the collateral inflammation subsided and now in a few of these cases, we have evidence of the deposition of calcium in the form of Ghon tubercles.

Although Heimbeck²⁴ had published an epoch-making article in 1928, it did not contain all the information I desired. In his personal communication of December 21, 1929, he made the following statement: "The general location is infiltration close to the hilus and enlargement of the hilus glands. In some cases the infiltration has on the Roentgen picture the form and location, which the Germans call "Fruhinfiltrat," and which I am consequently absolutely sure of is the prime infiltration and the immediate result of the prime infection (of the Pirquet negative, earlier uninfected.) If these infiltrations are diagnosed very early, before anything wrong is heard, that is: only on the basis of the tuberculin test, the general symptoms of a Febris catarrhalis and the Roentgen investigation, the prognosis is benign, which you will understand when I tell you that of my 79 cases of TB among nurses, only three have died. And the greatest part of them have after about one years treatment, been quite all right and able to take up their nurse job again." These findings agreed with ours. In an article published in 1931, Heimbeck²⁵ described a typical first infection type of disease.

Therefore, a sufficiently large number of cases of young adults have been observed, from the time they were negative to tuberculin through a period of exposure and development of foci of disease, to convince me that they react to the first infection type of tuberculosis in essentially the same manner as infants and children.

The fact is well established that if any number, let us say 1,000 infants, 1,000 children and 1,000 young adults are definitely exposed to tuberculosis for the first time, the majority of each group will become positive tuberculin reactors, indicating that the first infection type of tuberculosis exists in their bodies. Some of each group will develop pleurisy with effusion; some will have erythema nodosum; some may have other symptoms as the result of this first infection type of disease, but the vast majority of them will have no symptoms at all, or those so slight that they are unnoticed or misinterpreted. But among the positive reactors of each 1,000, whether infants, children, or adults, some are certain to develop the re-infection and destructive type of

tuberculosis. In some this will appear within a few weeks or months, after the first infection type has produced allergy; in others it will appear during any of the subsequent decades of life. The time will depend upon exposure to persons disseminating tubercle bacilli or the spread of bacilli from the primary foci or regional lymph nodes through rupture into the blood stream, bronchial tree, etc. Thus we see the infant dying of miliary tuberculosis or meningitis. We also see these conditions in the subsequent periods of life. In addition, we see the chronic destructive type of tuberculosis making its appearance months and years after the first infection type of disease develops.²⁶ Because of this long period of time necessary to develop chronic, destructive lesions, most students of nursing and medicine are with us for too brief periods of time to observe the end results of re-infection through exposure. On numerous occasions among our Lymanhurst group, five to ten years have been required after the re-infection type of disease could be clearly demonstrated by X-ray film examination before it caused illness. Here we have the explanation for Heimbeck's most recent findings. In a personal communication dated August 9, 1932, he called attention to the fact that among 454 student nurses who as probationers were positive tuberculin reactors, 15 have developed tuberculosis, of whom 11 have demonstrable pulmonary lesions and one has renal tuberculosis. Inasmuch as on entrance to the school, the entire 454 had the first infection type of tuberculosis, as manifested by the positive tuberculin reaction, it seems probable that the 15 with evidence of disease had the re-infection type unless some of the first infection lesions had not completely subsided when the students were admitted to the school.

Obviously, if one could have observed these girls and others in their communities when they first became infected, previous to their admission as probationers, a considerable number would have presented symptoms of the first infection type, such as erythema nodosum and pleurisy with effusion. If X-ray films could have been made periodically, beginning immediately after they became positive tuberculin reactors, a considerable number would have presented demonstrable first infection types of lesions, such as those he reports who became infected after admission to the school. One would have seen that some of the girls from which this group came developed re-infection types of tuberculosis and fell ill; some of them actually died. Therefore, the group of 454

positive reactors is a selected group. Of the 15 who were positive to the tuberculin test on admission, but who developed evidence of tuberculosis, not one has died. This is in keeping with our findings at Lymanhurst, that an interval of even ten years or more may elapse before sufficient disease of the re-infection type develops to cause fatal illness. In this group of 454 more of them will fall ill and several will die of tuberculosis. They have not been followed long enough to observe the final effects of their tuberculosis.

Among 253 girls who entered the Ullevål Hospital with negative tuberculin reactions but who upon exposure later reacted positively, 78 have developed evidence of tuberculosis as a result of their initial exposure. This is exactly what one would expect; that is, primary lesions have been demonstrated or symptoms have been experienced. In fact, in 35 of these cases erythema nodosum was present. This is a finding which so frequently accompanies the first infection type of tuberculosis that Dickey^{27,28} of Leland Stanford University considers it a very important diagnostic point. In 20 cases there was evidence of pleuritis. This we have found rather frequently as an accompaniment of the first infection type of disease from infancy through early adult life. Among the 253 reacting negatively to tuberculin on admission to the school of nursing, Heimbeck has had seven deaths, two of which were from tuberculous meningitis. These girls developed their first infection type of tuberculosis, which made them allergic upon their initial exposure. In short, each one had a culture of tubercle bacilli in her body. For them, either exogenous or endogenous re-infection resulted in the re-infection type of tuberculosis which has caused death fairly early, just as is true of a small percentage of individuals of any age group under similar circumstances. The remainder of the 253 who became positive to tuberculin are potential cases of destructive forms of tuberculosis. In each decade of life, some of them will fall ill and a few will die of tuberculosis as a result of the exposure they received while caring for tuberculous patients. Thus, 100 per cent of the 253 girls who entered training without foci of tubercle bacilli in their bodies, developed such foci before graduation and 31 per cent had symptoms or demonstrable lesions, while symptoms or demonstrable lesions in 13 per cent of the 707 students under observation.

We had no idea of the harm, both immediate and remote, being done our students of nursing

and medicine throughout the world by exposure to tuberculous patients until Heimbeck made these observations. His findings have since been confirmed for the most part by a number of workers, such as Geer.²⁹ Thus, our opinion which we gave so freely twelve years ago to the effect that it is safe for the student of medicine and the student of nursing to care for the tuberculous patient, with no special protection, was fallacious. Heimbeck³⁰ sees the harm that is being done his students and is making a desperate attempt to protect them by vaccination with BCG. Seeing the possibility not only of immediate but also of remote dangers from the introduction of living tubercle bacilli into the human body, we believe a safer method consists in protecting the student against exposure to tubercle bacilli through medical asepsis, as has been so effectively practiced in the control of diphtheria and typhoid fever.

These observations among tuberculin negative infants, children, and young adults would have been the most fascinating study I have ever attempted if it had not been so full of pathos. For twelve years I have prescribed bed rest for students of nursing and medicine; have advised them to cancel their registration and have even signed death certificates for such students before graduation or in a few years thereafter.

Our observations among these infants, children, and young adults have been quite as accurate as most animal experiments. In experimental tuberculosis, one is able to introduce a counted number of tubercle bacilli into the body of an animal negative to tuberculin while the number of bacilli transmitted from patient to student is unknown and uncontrollable. Approximately 100 per cent of the animals so inoculated will later react positively to the tuberculin test, while approximately 100 per cent of the students so exposed will also react positively to the test. In other words, both the animals and the students have developed foci of tuberculosis and each has a culture of tubercle bacilli in the body, in addition to that potentially dangerous condition which we know as hypersensitiveness, or allergy. From this point on we can not compare the two experiments, since animal species vary tremendously in their susceptibility to the different strains of tubercle bacilli, and since the life span of most laboratory animals is not sufficiently long to observe adequately the chronic, re-infection type of tuberculosis. Thus, twelve years of actual observations, not on guinea pigs or rabbits alone, but on human beings through infancy, childhood, and early adult life, have completely revolutionized

my views. I am now convinced more than ever before that the program of tuberculosis control among men and animals which has been in effect for many years has proved its worth. We have not "been shooting at the wrong target."¹⁴

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Surgery Among the Sioux Indians*

Fredrick Treon, M.D.†
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Mr. President, and Gentlemen of the Dakota Medical Society:

Living on an Indian agency, among an ignorant and superstitious race of people, is not the most desirable field in the world for the practice of our profession, and particularly that branch of it known as surgery. That the Indians with whom I have been associated for the past two years may in a degree be said to be advancing, but that they are still steeped in superstition and adhere to many of their heathenish and barbarous customs, is equally true; and he who goes among them to practice medicine under our present scientific manner, as adopted by the regular physician in an enlightened community must need expect to encounter many difficulties and discouragements. Truly may it be said that life on an Indian agency is not all smooth sailing. A man must be endowed with unlimited patience and superhuman forbearance. If he is ambitious and desirous of success, he will be sure to meet with disappointments, and often find himself on the verge of despair. If he achieves success and merits praise he must make up his mind that his skill will not be attributed to his knowledge, but will be considered in the light of something mysterious, and he be styled as a "Big Medicine Man." With them success is due to supernatural power. I doubt very much if the most enlightened among them have the least idea as to how we gain our titles and become Doctors of Medicine. Their ideas of diseases are very crude and always based upon superstition. Their native medicine men are the most remarkable of frauds and the amount of assurance they possess is truly wonderful. They are the ones who are holding the people back and keeping them in ignorance. And this must remain so as long as the government tolerates and allows the use of their own language in the education of their young. Too much praise cannot be given the present administration for the decided steps taken towards the excluding of the teaching in the vernacular in schools on Indian reservations. It is a valuable move in the right direction and will prove an important factor in the civilization of an ignorant

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†Dr. Treon died June 20, 1933—notice of which is on page 477 of this issue.

and down-trodden people. If during my sojourn among them I can do anything towards tearing down their superstitious ideas and lifting the floodgates and letting in a few rays of scientific light, I will have accomplished all that can be hoped for, and feel that I have not labored in vain.

The native medicine man is a most remarkable character, and with your permission I will tell you how these remarkable creatures get their wonderful power and become "Medicine Men." They go on the hill tops and in the extreme heat lie with their faces to the ground for days, and refuse food or drink, until from exhaustion they become delirious; then it is, they claim, that a spirit comes to them in the shape of a wild animal, or sometimes it is a weed that speaks to them and sings them a song, telling them the song will drive out certain diseases, or a certain herb will cure when administered by him. Then the man gets up, and, with a drum, is a full-fledged doctor. They treat their patients by "pow-wow" and drumming over them and singing over them a most dismal song, which is a deep guttural sound and hideous in the extreme.

You can always tell when they are at work, for they run up a medicine flag. White, red and yellow are their favorite colors for these emblems. This is to communicate with the Great Spirit, the Sun, or the Moon, and the fulfilling of a promise made by the "doctor" to the Great Spirit, for which he is to receive in return the restoration of the patient. Sometimes, however, they do administer remedies. I remember a case of conjunctivitis that fell into the hands of one of these "Medicine Men," and the eye was treated by putting brass filings into it. You may easily guess the result.

The Indian believes that all diseases are the result of certain power delegated to the "Medicine Man." They believe that consumption is produced by blowing into the system a seed of grass, and that he alone has power to heal them. They attribute headache to an evil spirit, and nothing but the drum and pow-wow will drive the spirit away.

They say that paralysis is the result of a shot from the evil spirit, while a boil is the effect of

a silent shot from a duck, and a carbuncle is from the silent shot of a goose.

When one of them gets very ill they have a medicine feast, and make medicine over the patient. I once attended a feast of this kind. The soup is made of dog, which is considered a great luxury. They all eat while the "medicine man" beats a drum and chants a most fearful and dismal ode, which is kept up for hours or until the soup is exhausted.

The Indians, as I have before stated, are very superstitious, and if they can avoid it they never allow the patient to die in the house or tepe (tent). When it does happen they tear down the house and never live in it again. I know of several instances in which this has occurred, and if the house was not torn down it was deserted and forever abandoned. I know of a house where an Indian left the remains of his dead squaw in the house and nailed the doors and windows fast, thus making a sepulchre of the house, and then left it.

As a rule they are now burying their dead, though some of them are placed upon poles or in the trees, while others are set on the hills with a sort of canopy of tepe cloth over them. Where a coffin is used they come for it before the patient dies, and if possible, put them into it and carry them out of doors to breathe their last.

I have now occupied so much of your time in discussing the customs and habits of these people that I shall be obliged to confine myself to giving in detail only one of the surgical operations that I have performed while among them, and which to me was interesting as well as a little out of the usual line.

During the summer of 1887, my attention was called to a growth upon the face of "Iron Elk," an Indian, aet. 65. It was a small lump about the size of a partridge's egg, located on superior maxillary bone and occupying the anterior part of the zygomatic fossa and orbital surface and appeared to be attached to the molar bone. I proposed an operation for the removal of the growth and gave as my diagnosis, the opinion that the tumor was fibrous. But as an Indian dreads the knife I could not gain his consent to have it removed. I then had him paint over the surface for a number of days a strong tincture of iodine, but it grew rapidly and by the first of the present year had become as large as a hen's egg, and had so encroached upon the eye as to be actually pushing it up and out of the socket, and it was causing extreme pain at the base of the brain, patient consented to having it removed, and accordingly on the 29th of January, J. B. Graham, M. D., agency physician at Lower Brule. (to whom I am indebted for valuable service,) assisting, we pro-

ceeded to operate, using the A. C. E. mixture as an anesthesia. Patient could not be brought under the influence and we resorted to chloroform, then to our chagrin, patient stopped breathing and his heart acted badly, but by vigorous efforts we succeeded in resuscitating him. I then proceeded to operate, making a vertical incision from the outer canthus of the left eye to the angle of the lower jaw, then dissected around the growth, in doing which several arteries were cut and had to be taken up. The tumor was quite large and fibrous. When I cut it off I found that there was a cavity underneath, made by disease, and the molar and portion of the superior maxillary and sphenoid bones were destroyed, and cavity extended back, as we afterward discovered, and communicated with the middle ear. To our great astonishment, the internal maxillary artery, weakened by disease, gave way and a very troublesome hemorrhage ensued. In vain did we attempt to stop it with the thermal cautery, as it was too deep to get at to tie, and we found ourselves as it were, working in the bottom of a deep well, which was constantly filling to overflowing with arterial blood; we tried plugging with pledgets of cotton wet with Monsel's solution of iron, but after repeated efforts had to abandon that plan. After removing all the loose pieces of bone we now concluded to plug and wedge. We used for our plug some sponges wet with Monsel's solution. We wedged them in and closed the wound with ligatures to secure the wedge and in this way brought the hemorrhage under control. But by this time the loss of blood had been very great and our patient was pulseless, and we expected he would die every moment, but after a hypodermic injection of diluted alcohol he began to rally.

Outside of the hut we were operating in had gathered a mob of wild and desperate Indians, who were becoming very much excited and dangerous. They talked freely about taking a life for the one they considered they were losing. They declared we had cut off every artery of the poor man's heart, and not being satisfied were running red hot irons into the wound. But as the man did not die the excitement subsided, and, to my relief, the mob disappeared.

Sunday evening, the same day we operated, the patient rallied sufficiently to take some stimulants and a few spoonfuls of soup, after which he shook hands with his wife.

Monday morning; the patient rested quietly; temperature 99, pulse weak and about 90; complains of throbbing in the wound and roaring in the head.

Monday evening; temperature 100, pulse 93;
(Continued on Page 474)

A Simplified Method for Intra-pulmonary Lipiodol Injection*

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Sioux Falls, S. D.

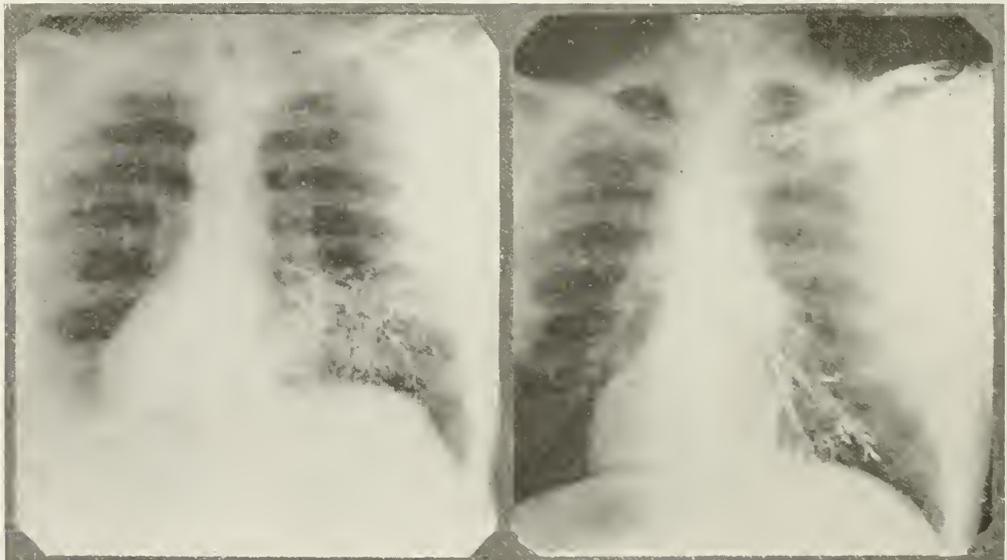
THE psychic factor often defeats the purpose of administering lipiodol for diagnosis in pulmonary disease. If, however, one can assure the patient that there will be no pain or gagging in the procedure, an excellent lipiodol picture can be obtained in spite of the nervousness of the patient. It must be remembered that patients with pulmonary disease are often debilitated and have suffered from pain and productive cough for so long that the thought of future discomfort is too much for them. Many will not submit to a bronchoscopic, supracricoid, or intralaryngeal lipiodol injection. I have recently combined two well know procedures (the Ochsner and Pritchard methods) and obtained very satisfactory results in this apprehensive type of patient.

Some time ago Dr. Alton Ochsner pointed out that the swallowing reflex was lost for a short time if the pharyngeal ring were painted with 10% cocaine solution. He took advantage of this and had his pulmonary patients try to drink lipiodol after cocainization of the pillars and uvula. Since the swallowing reflex was gone, the opaque

medium went down the trachea and he was able to get splendid filling of the bronchial tree. However, some patients have a fairly straight and patulous oesophagus so that regardless of losing the swallowing reflex, the medium goes into the stomach. One should use a fluoroscope to be sure this does not happen and a film thereby be wasted. Again, the swallowing reflex is not always completely lost or it comes back before the lipiodol is taken into the mouth. Thirdly, some patients object to the taste of the iodized oil. Pritchard overcame some of these features by carrying his anaesthetization a little further so that the larynx was insensitive enough to permit a canula to be introduced in the transglottic method. He sprayed the pharynx and larynx with 10% cocaine solution. There is an objection to this procedure in that laryngeal anaesthetization causes the patient discomfort and requires some technic to accomplish.

Alton Ochsner's method of cocainizing the pharyngeal ring also does away with the gag reflex. The warmed iodized oil is not irritating to the larynx or trachea. Therefore, the following simplified technique for anaesthetization and lipi-

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Normal bronchial tree after lipiodol injection. Note the "snowstorm" effect of lipiodol in the alveoli and the decreasing diameter of the bronchi as they proceed distally. In bronchiectasis this "snowstorm" effect of alveolar filling is not present. Compare with next plate. There is some fibroid tuberculosis of the left apex in this case.

Slight grade of tubular bronchiectasis which was erroneously diagnosed as chronic bronchitis for eighteen years. Note there is no "snowstorm" effect of alveolar filling and the distal ends are approximately the same diameter as the proximal.

odol administration has been devised by combining the two methods of Ochsner and Pritchard in order that it may be used by the general practitioner in the office, hospital or home. One need not be a specialist to use this method and every physician should use lipiodol in questionable lung disease instead of assigning the diagnosis to the bronchitis junk-heap.

The technique of anaesthetization is as follows: Preliminary steps:

1. Have the patient cough up all sputum.
2. Give $\frac{3}{4}$ gr codeine sulphate per hypo.

Anaesthetization: (In some patients, no anaesthetic is necessary.)

1. With cotton applicator paint pharyngeal ring with 10% cocaine solution until it is blanched or until swallowing reflex is lost, as gauged by movement of thyroid cartilage. Both anterior and posterior pillars and the uvula should be cocaineized. This takes about five minutes.

2. Instruct patient not to cough while oil is injected and not until after the X-ray has been taken.

Injection:

1. Have patient put out and grasp his tongue with a piece of gauze. The injection may be done while the patient is standing, sitting or lying down as desired. If the upper lobes are to be injected the patient should lie with the shoulders lower than the hips for one minute before the picture is taken.

2. Introduce the Pritchard canula into the mouth so that the point is just back of the uvular tip. Inject the warm iodized oil slowly.

3. If the right lung is to be injected, have patient lean 45 degrees to the right, if standing or sitting. If the left, 45 degrees to the left during injection.

4. The X-ray picture—Increase the exposure by one-half.

Any one can get good lipiodol pictures with the above method and thereby make an accurate diagnosis. Almost every chronic chest condition is

diagnosed chronic bronchitis, the junk-heap diagnosis. Very few chronic chest conditions are due to chronic bronchitis alone. There is nearly always some underlying disease process to keep the chronic bronchitis going. A true acute bronchitis seldom lasts longer than six weeks. If a so-called chronic bronchitis lasts longer than six weeks there must be some other condition present. Usually this is tuberculosis, bronchiectasis or lung abscess—occasionally undiscovered empyema with a pleurobronchial fistula.

The diagnosis of tuberculosis is not always easy. Some patients have no cough or sputum. Some with productive cough never reveal the bacillus tuberculosis. In the physical examination, the most useful procedure for bringing out typical tuberculosis rales is to have the patient exhale and give a slight grunt or cough before inhaling. A shower of rales often results which could not be heard otherwise. Lipiodol may be administered in mild chronic tuberculosis without harm.

A lung abscess may act exactly like a chest cold but it continues for a longer time. The sputum may be scant and atypical. A lipiodol injection frequently shows up such an obscure abscess.

Bronchiectasis may have no symptoms except persistent dry cough and the physical findings may be negative. Low grades of bronchiectasis are easily diagnosed with lipiodol.

In missed empyema with pleurobronchial fistula, the patient usually gives a history of an old empyema that was drained or a prolonged attack of pneumonia. Lipiodol is a great aid in these cases.

After doing about two hundred lipiodol injections, I have come to the conclusion that it is a perfectly harmless procedure if not used in acute cases and if proper preparation has been done.

In summary, a simple method of lipiodol injection has been given with the urgent suggestion that it be used in all obscure chronic lung conditions.



Tuberculosis of Animals and Man*

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FOR centuries tuberculosis has constituted one of the most serious scourges of the human race. Since the latter part of the last century it has been recognized as one of the most devastating diseases affecting certain species of our domestic animals. Its control and eradication therefore constitute problems calling for the combined efforts of all members of all branches of the medical profession.

No comprehensible estimate can be made pertaining to the amount of research work which has been conducted to determine the relation between tuberculosis in animals and tuberculosis in the human family. This work has not been completed; in fact it most probably has only been started, but even in its present state of incompleteness, it has undeniably demonstrated many respects in which the disease in animals is similar to tuberculosis as it affects man. The human type of organism is responsible for the infection in many cases studied in animals and some of the types of the organism common to animals have been definitely identified as the causative organism in numerous cases of human tuberculosis. No one can predict the results of further research on this subject. Therefore no one is qualified to state that this future work may not bring out facts to prove that the disease in various branches of the animal kingdom is even more closely related than we now believe it to be. Further studies will either intensify or obliterate the present points of differentiation. It therefore behooves us as physicians, veterinarians and sanitarians to maintain an open minded attitude towards the entire subject and so to exercise our judgment under all circumstances that our patients and clients may enjoy the maximum degree of safety.

One of the chief points of distinction between tuberculosis in man and in animals concerns the *type* of the organisms most common to the disease in each. Scientific workers have apparently proven the existence of three chief types of the organism, which, as you know are the human, the bovine and the avian. The matter of the proper methods for differentiating these types has been the subject of considerable controversy. Some men attach great significance to differences in cultural

*Read before the South Dakota State Medical Association, Huron, S. D., May 16, 1933.

characteristic, morphological distinctions, biochemical peculiarities, etc. It is believed, however, that the majority of workers at the present time take into consideration the virulence or pathogenic properties of a given organism for certain laboratory animals. In the field of veterinary research the guinea pig, rabbit and fowl (chicken) are used for this purpose with the following interpretation of the results:

Type	Guinea Pig	Rabbit	Fowl
Bovine	x x x	x x x	o
Human	x x x	x	o
Avian	o	x x x	x x x

x x x—Readily infected.
x—Slightly infected.
o—Non-susceptible.

While this is believed to be the best method known for typing the organism, it unfortunately is not entirely satisfactory. There are apparently some intermediate or possibly transitional or aberrant types which defy classification by this method. The significance of these transitional or aberrant types can not be definitely stated. Their existence is a matter of some concern to at least some of our authorities, who regard them as a possible indication of a closer relation between tuberculosis of the various species than we desire to believe. Van Es, one of the outstanding veterinary authorities on the subject states "All tuberculosis regardless of the bacillary types involved, have as their primary cause only one specific biologic form, the *Bacillus Tuberculosis*, possessed of a remarkable genetic plasticity and of a conspicuous power of adaptation. This fact alone is an indication that in the general efforts of eradication, live stock sanitarians should remain apprehensive of what heterogeneous bacillary varieties may ultimately bring about."

The activities of the *human type* are particularly confined to men, the various monkeys, parrots and occasionally swine. About 50 per cent of the disease in dogs and much of the tuberculosis of wild animals in captivity is caused by the human type.

The *bovine type* is responsible for practically all tuberculosis in cattle as well as in the goat and cat. Practically all generalized tuberculosis in swine, 50 per cent of the canine tuberculosis and some tuberculosis in the horse is caused by the bovine type. Statistics from many parts of the world bring out the fact that the bovine type is

frequently responsible for the disease in men. Only a few years ago one eminent writer estimated that 25 per cent of all cases of tuberculosis in children under five years of age were caused by the bovine organism—where unpasteurized milk formed an important part of the diet. Fortunately the disease in these patients is usually extra-pulmonary in nature, most frequently being encountered as a localized condition affecting the glands, bones, mening, etc. In spite of this favorable fact, it is nevertheless tuberculosis and constitutes a serious phase of the tuberculosis problem.

The *avian type* is the cause of practically all tuberculosis in our common barn yard fowl, turkeys, guinea fowl and wild fowl when kept in confinement. Recent investigations have revealed the important fact that avian tuberculosis of a more or less localized nature is exceedingly common in swine—in those sections where the prevalence of the disease in the poultry is extensive.

The case of the susceptibility of cattle to the avian type of organism is a peculiar one. Cattle are readily susceptible to this type of the organism to the extent of becoming sufficiently sensitized to give a positive reaction to avian tuberculin, but not to tuberculin prepared from the human or bovine organisms. They seldom develop visible lesions and the state of sensitization to the avian tuberculin is transient if the cattle are removed from the source of infection.

Most American authorities deny the infectivity of the avian type of organism for man, but a number of cases have been reported by European investigators. Klimmer, for example, reports that a search of the literature reveals the records of approximately thirty-five such infections. It is indeed fortunate if man possesses a high resistance to the avian organism, because investigators have proved that the organism is occasionally found in eggs laid by infected hens.

TUBERCULOSIS IN POULTRY

Tuberculosis in *poultry* has increased until it now threatens to seriously injure the poultry and swine industries of our country. Lash of the U. S. B. A. I. reports that avian tuberculosis was found on 80 per cent of the farms in some townships of the corn belt, where all of the poultry was tested. He also reports that in those instances in which the reactors were autopsied 10 per cent to 15 per cent of the cases were generalized.

Fortunately the control of tuberculosis in poultry does not present the economic problems encountered in its control in cattle and swine.

Results to date indicate that the conscientious operation of a simple plan will in most instances eradicate the disease from a given flock. In poultry the disease affects chiefly birds more than one year of age and the prevalence of the disease in poultry less than one year of age is very slight. Fortunately the most productive period in the life of the hen is prior to the age of one year. Therefore the practice of annually marketing all of the birds on the premises not only constitutes a profitable economic procedure but it is also a procedure which will reduce to a minimum or eradicate avian tuberculosis. This practice should be supplemented by the artificial incubation of chicks and by raising them on clean ground.

In pure bred flocks where the blood lines are of unusual value, it is of course possible to control the disease by a system involving periodic tuberculin testing and the removal of all positive reactors.

TUBERCULOSIS IN SWINE

The seriousness of tuberculosis in swine has long been recognized because of the appalling economic losses which it has inflicted upon our live stock industry. The prevalence attained by the disease is strikingly illustrated by figures from reports compiled by the U. S. B. A. I. These reports show that during the fiscal year of 1922 in all of the slaughtering establishments operated under federal inspection, 14.3 per cent of all of the hogs killed revealed from slight to generalized lesions of this disease.

Tuberculosis in swine, especially when generalized, is most frequently caused by the bovine type of organism and is usually contracted as a result of contact with tuberculous cattle or with tuberculous hogs. The infection perhaps most frequently involves the lymphatic system, however it is frequently observed in such organs as the lungs, liver, spleen and intestines. In fact, lesions may be found in practically any organ or tissue of the hog's body.

Swine are also quite susceptible to infection by the avian type of organism as a result of contact with tuberculous poultry. Infection in the hog by this type of organism is usually characterized by a more benign course and by a greater tendency towards localized lesions than in cases caused by the bovine organism.

Veterinary literature contains several reports of instances in which tuberculosis in swine was caused by the human type of organism. These reports concern herds which had been fed raw

garbage or other materials from institutions caring for human tuberculous patients.

The effective control or eradication of tuberculosis in swine depends to a great degree upon the extent to which bovine tuberculosis is controlled, because infected cattle are the most potent source of infection for the swine. To a less degree, the control of the disease in poultry is a prerequisite.

An effective program for the control of swine tuberculosis, therefore should include:

1. Prevention of contact with tuberculous cattle or the consumption of their unpasteurized dairy products.
2. Prevention of contact with tuberculous poultry and,
3. Prevention of contact with tuberculous hogs.

The vast majority of hogs are marketed comparatively early in life. This practice greatly reduces the spread of the disease from hog to hog. Breeding stock maintained for several years should be tuberculin tested in order to prevent transmitting the infection to successive "crops" of pigs.

On premises and in localities where the above control measures have been conscientiously employed, the results have been highly gratifying.

Even where only some of these measures have been practiced, a marked reduction of the disease has resulted. For example, in many of the territories which send hogs to the Sioux City market, the testing of the cattle for tuberculosis has been systematically practiced for several years. That the removal of the infected cattle is actually reducing the amount of tuberculosis in the hogs raised on these premises is indicated by the official records at the Sioux City packing plants having federal meat inspection. During the year 1932 the per cent of all swine carcasses condemned because of tuberculosis was less than one-fifth of the per cent condemned during 1915. This remarkable reduction in the condemnation of hog carcasses is impressive evidence of the efficiency of the methods being employed for the control of animal tuberculosis.

TUBERCULOSIS OF CATTLE

The date of the first recognition of tuberculosis of cattle in this country is not definitely known, however, we know that the U. S. Department of Agriculture considered it a serious menace as early as 1893, in which year they began the manufacture of tuberculin. Its spread throughout the country was rapid and little progress was made towards its control until 1917, at which time its prevalence had become so extensive as

to lead the various state and federal livestock sanitarians to unite their forces and efforts in a co-operative plan for its control or eradication.

During the year of 1915, 4.8 per cent of the cattle slaughtered under federal meat inspection at Sioux City were tuberculous. From 1918 to 1923, approximately six per cent of all cattle subjected to the tuberculin test in Iowa gave positive reactions—the per cent of reactions in certain other states was much greater. In 1906 Anderson found tubercle bacilli in 6.72 per cent of 253 samples of milk collected in Washington D. C. In 1908 Campbell found tubercle bacilli in 13.8 per cent of 130 samples of milk collected in Philadelphia. In 1909 Hess found the organism in 16 per cent of the samples he collected in New York. These figures indicate the foothold the disease had gained and the extent to which it menaced public health and the future of our cattle industry prior to the application of effective measures for its control.

As previously stated, practically all cases of tuberculosis of cattle are caused by the bovine type of organism. It is true that the avian type is occasionally isolated from bovine cases, but it should be clearly understood that avian tuberculosis is not sufficiently prevalent in cattle to constitute an economic problem, nor is it a factor of great importance in the control of bovine tuberculosis.

The lesions of the bovine disease may be found in practically any tissue or organ of the body. Such organs or tissues as the lymph glands, the lungs, the serous membranes, the liver, spleen, udder and kidneys are most commonly affected.

The symptoms of the disease in cattle, except in certain advanced cases, are frequently imperceptible on physical examination. Because of this fact, the tuberculin test is almost universally employed for diagnosis.

The tuberculin test in the field of veterinary medicine has been developed to a very high degree of efficiency and the progress which has been made in the control of bovine tuberculosis would not have been possible without it. Derogatory statements regarding its accuracy from time to time have been made by those opposed to present methods of tuberculosis control, but a great volume of experimental data as well as millions of records pertaining to its use in the field, conclusively prove that it is accurate to an amazing degree. The disease has been eradicated from many thousands of badly infected herds, through the use of the test and the removal of reacting animals. In fact, there are in our country today approximately three million

two hundred thousand herds of cattle, which now have at least one negative test to their credit. Some critics, failing in their attempts to discredit the test from the standpoint of its accuracy, have asserted that tuberculin is injurious to the healthy or non-tuberculous cow. Numerous experiments are on record which prove that no ill effects whatsoever were observed in healthy cattle into which were injected amounts of tuberculin many times the quantity used in routine tests.

In conducting tuberculin tests, the veterinarian may employ one or more of these three methods—the ophthalmic, the subcutaneous, or the intradermic test. A special tuberculin is prepared for each test.

In the *ophthalmic test* the concentrated liquid tuberculin, or the precipitated tuberculin in tablet form, is placed in one eye. The other eye is observed as a control. If a positive reaction occurs it is usually evident in 6 to 12 hours (sometimes later) and consists of an inflammatory reaction characterized by lachrymation and by redness and swelling of the mucous membrane of the eye. The inflammation continues until the discharge becomes muco-purulent or purulent and it may cling to the hairs below the inner angle of the eye to form a yellowish crust.

The ophthalmic test is not extensively used except as a check test in conjunction with one of the other tests.

The *subcutaneous test* was the first to be extensively used in this country. Its application requires the subcutaneous injection of about four cc's of a dilute tuberculin prepared for this test. The temperature of an animal to be tested is taken periodically for several hours or for an entire day in order to determine the normal temperature range for each animal prior to the injection of the tuberculin. Beginning six to eight hours after the injection of the tuberculin, the temperature is taken at intervals of two hours until approximately the 24th hour following the injection. A positive reaction is indicated by a pronounced elevation of temperature which usually recedes after several hours to the pre-injection temperature, forming a rainbow temperature curve. Variations are sometimes observed in the post-injection temperature curves of reacting animals, however the description of these by the U. S. B. A. I. is sufficiently clear to accurately guide the experienced veterinarian in arriving at dependable decisions under such circumstances. Frequently a general systemic reaction including chills, looseness of the bowels, etc., is observed in conjunction with a positive reaction.

Because of the laborious nature of the sub-

cutaneous test and because the animals must be continuously confined during its application, it has been very largely replaced by the *intra-dermic test*.

In the latter test a concentrated, special strength tuberculin is used, of which approximately two drops are placed between the layers of the skin. A number of sites may be selected for the injection of the tuberculin, but one of the folds or "pillars" of skin situated at either side and below the base of the tail has been almost universally adopted.

Following the intra-dermic injection of the tuberculin, the site of injection need not be examined for 72 hours. If reactions are observed in a herd at this time, it is advisable to make subsequent examinations at the 120th and possibly 144th hour for additional reactions in other animals. A positive reaction is indicated by the development of a characteristic reaction or swelling at the site at which the tuberculin was injected.

In the interpretation of the results of any of these tests, it should be borne in mind that the intensity of the reaction is not an index to the extent of the infection in the reacting animal. In other words, a mild reaction may be observed in an extensively infected animal and vice versa. The inability of the test to indicate the degree of infection is not a handicap in an eradication program because in such a program all animals harboring infection, regardless of its extent, must be disposed of. The infected animal with closed lesions today may develop open lesions and become a dangerous spreader tomorrow. Also an animal with slight lesions of the udder is a greater menace than an animal with more extensive closed lesions elsewhere.

The remarkable accuracy of the tuberculin test has been responsible for some of the criticism heaped upon it by its opponents. The test is so sensitive that positive reactions are occasionally obtained in animals in which the disease has not progressed to the point where visible lesions can be demonstrated in the carcass. (Cite work by Schalk). Bacteriological examinations of tissues from the carcasses of many of these "no lesion" reactors usually verify the accuracy of the test.

Animals in which the disease has reached an advanced stage sometimes fail to react to the test. It is natural to assume that such animals should be less sensitive to tuberculin because their tissues are most probably well saturated with the metabolic products of the infecting organisms. These products probably include a

(Continued on Page 475)

Significance of Bleeding from the Bowel*

Philip W. Brown, M.D.†
Rochester, Minn.

LOSS OF time, money, health, and even death result from the present-day tendency glibly to ascribe bleeding from the bowel to "piles," or abdominal distress due to "colitis." The various health articles in periodicals and newspapers, and the alluring, pseudoscientific advertisements serve to confuse and deceive many people; this attitude to these complaints may explain the not infrequent tendency to leap to such a diagnosis without substantiating it by at least a physical examination. In spite of repeated emphasis by many physicians, it is still startling to find so few patients who have even had a digital examination of the rectum until weeks or even months have elapsed from the time of their first visit to inquire about the bleeding from the bowel. I find it helpful to consider bleeding along the following lines:

Color—If the blood is black, tarry, and rather sticky, it usually implies hemorrhage high in the intestinal tract, as from an ulcer or ruptured esophageal varices. Dark red blood usually comes from a bleeding point in the colon, whereas blood from the anus is bright red.

Time of bleeding—If the blood is mixed with the stool, the source of leakage is usually high enough above the anus to permit mixing with the feces. Anal bleeding is characterized more by a squirting of blood, usually at the end of the bowel movement. Or, if there is a bloody streaking on the feces, there is a bleeding point somewhere from the sigmoid to the anus. Massive hemorrhage from the colon or rectum is rare, and if it occurs the blood is usually distinctly red and contains but little fecal matter.

Amount of bleeding—It is hard to estimate the amount of bleeding, but loose movements containing flecks to small clots of blood are rather common in ulcerating lesions. The amount of blood in malignant lesions of the colon and rectum is usually small with each stool. It is always important to distinguish between actual diarrheic stools with blood, and bloody, slimy stools that are not diarrheic: in fact, the patient may be constipated in spite of passing several stools a day. Of course, the actual amount of bleeding is only learned by the estimation of hemoglobin.

With regard to the general symptoms of lesions

*Read before the Cass County Medical Society, Fargo, North Dakota, April 28, 1933.

†Division of Medicine, The Mayo Clinic, Rochester, Minn.

of the colon, it is helpful to consider the bowel as divided into right and left portions. The right half of the colon is developed with the midgut and receives its blood supply from the superior mesenteric artery. The left half is derived from the hindgut and is supplied with blood by the inferior mesenteric artery. On the right side, the colon may have some absorptive function, and certainly it is the area in which water is absorbed. Due to the larger caliber of the right half of the colon, obstructive lesions are less common and the lesion, if inflammatory or neoplastic, usually manifests itself by reflex gastric symptoms, vague indigestion, some discomfort or mild pain, gas and commonly secondary anemia. Often the early syndrome of lesions of the right half of the colon suggests chronic appendicitis or cholecystitis. As the left half of the colon is approached, the symptoms of disease may be obstruction, and hence the reservoir function is disturbed, or, if inflammatory, frequent stools result. Aside from acute infections, such as cholera, the severe diarrhea occurs when there is ulceration in the sigmoid and descending part of the colon. An equal degree of severity and extent of ulceration in the right half of the colon may result in only a fourth as many movements, although the general condition of the patient may be worse.

It has been stressed repeatedly that the earliest symptoms of colonic obstruction are vague, colicky pains, rumbling of gas, and perhaps some constipation. This does not imply that everyone with a cramp-like pain has an obstructive lesion of the colon, but certainly if such a patient is annoyed enough to seek advice, I believe that a barium enema is justifiable. We will know the seriousness of trying to remedy trouble after acute obstruction has taken place. Surgical statistics of today and of twenty-five years ago show but little decrease in the mortality from acute obstruction. This imposes on the physician the urgent need of early recognition of such conditions. Years ago, Carman called attention to the fact that in 50 per cent of patients dying from carcinoma of the colon, the condition was still a local disease, death being due to perforation or obstruction and peritonitis.

I think it is worthy of note that although the

bleeding from the bowel is a critical point in the history, yet rarely is gross blood recognized in malignant lesions above the sigmoid. In ulcerative lesions, blood is more commonly seen. In general, then, gross blood should cause one to think of chronic ulcerative colitis, carcinoma, amebic colitis, polyps (single or multiple), non-specific ulceration or solitary ulcers, radium ulceration, and only when these have been ruled out by proctoscopic and often by roentgen examination, should the bleeding be ascribed to hemorrhoids or fissure.

The most common cause of bleeding is hemorrhoids or fissure, but if other lesions are to be recognized promptly these anal conditions should be considered last. About ten years ago, Buie called attention to the fact that about 20 per cent of patients with carcinoma of the rectum had been treated for hemorrhoids after the onset of symptoms of carcinoma. I fear that this percentage has not been materially reduced; this, too, in the face of the fact that 90 per cent of carcinomas of the rectum and rectosigmoid can be felt with the examining finger.

In the colon the most common sites of carcinoma are the cecum and sigmoid; in the rectum, the largest number originates in the ampulla and at the rectosigmoid. The simple, yet important maneuver of sweeping the examining finger around and up will minimize the chance of missing the growth. Likewise in roentgen examination, special attention should be paid to the cecum and sigmoid.

I do not deprecate a carefully taken history, but I do not think an accurate and localizing diagnosis is possible until complemented by physical and laboratory examinations. These examinations cannot always be carried out, nor are they invariably necessary, but careful palpation of the abdomen and digital examination of the rectum can always be done. If doubt remains, or if symptoms do not promptly subside, then proctoscopic and roentgenologic studies must be made. If diarrhea is present the stool should be examined for parasites, and cultures should be made for such organisms as the dysentery bacillus or the diplostreptococcus of chronic ulcerative colitis.

The most satisfactory roentgenologic examination of the colon is obtained, I believe, with the barium enema. Exceptions to this are to be found in occasional cases of lesions in the ileocecal coil. Furthermore, the use of the enema prevents the danger of giving an overdose of barium by mouth and perhaps producing a complete and effective blockade at the site of a lesion which in itself had all but produced blockage. The chief difficulty in

the use of the barium enema has been in the faulty preparation of the bowel. Liquid feces or fecal masses produce bizarre and confusing pictures, and most of the misleading shadows I have seen in roentgenograms have occurred when attempting to interpret such films. Failure to distend the bowel properly also leads to errors in interpretation. The recent method of injection of air into the colon after partial evacuation of the barium has resulted in obtaining films which have done much to identify solitary and multiple polyps of the bowel.

I should like to call attention to the fairly high occurrence (5 per cent or more) of diverticulosis in patients aged more than forty years. Although it is difficult to obtain an accurate figure, probably not more than a sixth of such patients have symptoms, that is, diverticulitis. Of this small group, complications develop in approximately a sixth which necessitate operation. Bleeding rarely occurs in diverticulitis and if present, careful investigation should be made to insure that carcinoma is not present. Diverticulitis is not a forerunner of malignancy, although in some cases, the lesions coexist.

Preoperative measures in the treatment of acute and chronic bowel conditions cannot be considered here. However, I should like to emphasize the need of rehabilitating the patient so far as his condition permits. If operation is necessary immediately, fluids can be given intravenously during the procedure; in less acute conditions, ample fluids may be given by mouth if feasible, otherwise intravenously. Ten per cent glucose in physiologic sodium chloride solution is the most suitable, unless the patient has diabetes. Blood transfusion is indicated if the patient is anemic, and the concentration of hemoglobin is less than 40 per cent. I am sure that if it is possible to let a patient rest following a hurried trip to the hospital, with its inevitable strain, loss of fluids, and anxiety, that the surgical risk is definitely decreased. Of course, lesions such as ruptured ulcers do not permit this delay, but in less acute conditions, some delay is usually possible. Obstruction due to carcinoma usually will subside in a day or two, at which time not only is the operation done at less risk to the patient, but the surgeon usually is able to perform a more complete operation and settle any doubt as to what else may or not be accomplished.

SUMMARY

Perhaps one cause of error of earlier recognition of ulcerative or malignant lesions of the bowel is the too glib diagnoses of "piles" and "colitis."

The diagnostic significance of the color of the blood, time, and amount of bleeding from the bowel are considered.

Lesions of the right half of the colon are more likely to give vague reflex symptoms referable to the upper part of the abdomen, whereas lesions of the left half of the colon produce either severe diarrhea or symptoms of obstruction.

Although history taking, and general examination are essential, yet accurate diagnosis of dis-

eases of the colon and rectum is frequently not possible without proctoscopic and roentgenologic examination.

Preoperative supportive measures are of the utmost value and should always be instituted, if possible.

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SURGERY AMONG THE SIOUX INDIANS (Continued from Page 465)

has taken a little nourishment and some more stimulants: gave him 5 grs. sulph. quinia and $\frac{1}{4}$ gr. powd. opium.

Tuesday, temp. 99, pulse 85; patient has passed a comfortable night; removed the bandage, face very much swollen; clipped some of the stitches; dressed it with a solution of carbolic acid and gave quinine and iron freely.

Wednesday, temperature 99, pulse 78; removed part of the plug, from which wound there was considerable hemorrhage, but which I controlled with ice. I now concluded to allow the balance of the plug to remain in the cavity, as I feared secondary hemorrhage if I removed the pressure.

I used freely a wash of bi-chloride of mercury. I confess I was constantly in fear of blood poisoning, or tetanus, resulting from the plug in the wound; but patient continued to do well up to the fifteenth day after the operation, when I again removed another of the sponges, leaving still another, which appeared attached.

The wound continued to heal, and one month from date of operation I cut away all the sponge possible, but some of it had grown to the flesh and now, nearly five months after the operation, the wound is still open, but very much contracted, and a very small piece of the sponge remains adhered to the flesh.

In the care of this case after the operation many difficulties were encountered, and the slightest reverse in symptoms called down a perfect

storm of indignation upon my head. Recently this patient had a violent attack of peri-typhilitis, when "No Hand," the brother of "Iron Elk," declared it was due to the operation and again threatened to kill all who in any way assisted in the operation. They know nothing about nursing their sick, and to treat them in a dirty hut, or tepee, lying on a cot filthy with dirt or vermin, and their food of the coarsest and worst prepared imaginable is indeed discouraging. And add to this the fact that these people are inoculated with some specific poisoning, a disease that is hereditary, and you may begin to have some idea of what it is to practice surgery among them.

But under all these unfavorable circumstances, my patient is in excellent spirits and fair health, and the wound fast closing. If it does not close entirely I shall close it by a plastic operation.

To me there are some very interesting points about this case, i. e.:

First, the diseased cavity under the tumor;

Second, the rupture of the internal maxillary artery at that particular time;

Third, the growth of the sponge to the flesh; and,

Fourth, the amount of bone destroyed and removed at the base of the brain, together with the great loss of blood without destroying life.

Thanking you, gentlemen, for your courtesy,

I beg to remain,

Very respectfully yours,

Frederick Treon, M. D.

Agency Physician

TUBERCULOSIS OF ANIMALS AND MAN

(Continued from Page 471)

natural tuberculin which desensitizes the tissues. In the examination of herds these advanced cases can usually be detected by physical examination. Thus we see that this occasional error in the application of the tuberculin test does not materially detract from its value in an eradication of control program.

While the effective employment of the tuberculin test has been the cornerstone in the amazing progress made to date in the control of tuberculosis in our country, other measures employed in conjunction are of great importance also. These concern the cleaning and disinfection of infected barns or premises and certain rational procedures to prevent the re-introduction of tuberculosis into a herd or into a district from which it has been eradicated. If the owners of infected herds appeal to the livestock sanitary authorities for assistance, they will agree to test the animals and pay and indemnity for those removed because of infection, provided the owners will agree to dispose of the reactors and follow rational measures to prevent the re-introduction of the disease into their herds through the introduction of infected animals.

After witnessing the successful operation of this plan on a limited scale, progressive livestock owners co-operating with the federal and state officials, established a system of measures which would enable them to consolidate the gains as they were made against tuberculosis. They divided the country, states and counties into units and directed their combined efforts towards the systematic control or eradication of the disease from each unit progressively. This plan is known as the "area plan" of control.

The success of this tremendous undertaking has been phenomenal. Within the period of about ten years, the number of condemnations and retentions in packing plants and the number of positive reactions to tuberculin tests in the field have been reduced to a point which clearly indicates the possibility of either the complete eradication of bovine tuberculosis from our country or of subduing it to a point of insignificance as an economic factor. In substantiation of this statement the latest official reports show that the extent of bovine tuberculosis in this entire country is now approximately 1.4 per cent whereas the incidence ten years ago was four per cent. There are 3,072 counties in the United States. In only seven per cent of these counties does the disease exceed one per cent and in 1,562 counties (51 per cent) the infection is encountered in less than 0.5 per cent of the cattle. There are now nine entire states in which the tests prove that the disease has been reduced to an incidence of 0.5 per cent.

Figures of this nature most convincingly demonstrate many facts of which the following are only a few:

1. That effective steps to curb the ravages of tuberculosis were decidedly necessary.
2. That the tuberculin test is remarkably efficient in detecting infected animals.
3. That the co-operative plan has demonstrated its efficiency in the control of animal tuberculosis.
4. That the benefits accruing to each community render the co-operative plan a profitable economic procedure.
5. That the phenomenal reduction in the incidence of tuberculosis of cattle since the inauguration of this program supports the belief that the early and complete control or eradication of this disease is now a modest prediction.





The JOURNAL LANCET

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South Dakota State Medical Association
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MINNEAPOLIS, MINN., SEPTEMBER 1, 1933

FAITHFUL IN LITTLE THINGS

There is a popular expression in Swedish "små sår och fattiga föräldrar skall man icke förakta" which translated means "small sores and poor parents one should not despise" and applicability may be found for it every day in the practice of medicine. Think of how a little blister on the heel may lead to pyemia; a cap pistol explosion may result in tetanus and an innocent appearing erosion later show malignancy.

To be sure, no honorable physician will make mountains out of molehills. Sometimes it may be necessary to exaggerate the danger to a recalcitrant patient who has shown a disposition to neglect himself with reckless bravado, but on the whole, it is far more often the function of the physician to allay fear. Perhaps he has become too prone to allay fear.

Everyone who goes to the trouble of consulting a physician has a problem that deserves respectful consideration and his anxiety must not be treated with contempt. Trifles should not be exaggerated, neither should they be neglected.

THE INDUSTRIAL CODE

Physicians naturally wondered what their status would be under the national industrial recovery act. Well, up to the present time it has not been thought necessary to put them under its regulations. The practice of medicine, in

itself, is not an industry hence codes, prescribing stipulated fees and hours of labor, cannot be enforced.

Only so far as the physician is engaged in an economic activity is he affected by this act. Whatever help he may employ, working under the code, he must recognize and of course everyone is directly or indirectly affected.

Those who expected forty hours a week, daylight labor and undisturbed nocturnal repose are disappointed, but there is much to be thankful for and physicians may be counted on to do their part, whether the stork changes his uncertain visiting hours or not.

Perhaps the laity through this enforced experience will have a better understanding of the principles or code of ethics of the medical profession that has so often been criticised and ridiculed in the past.

TWIN CITY WATER PROBLEM

The water supply of any community must be one of its most important considerations. Medical officers are instructed to have this uppermost in mind when army camps are established; not only in the proximity of good water but on a sandy soil that is not conducive to surface drainage and consequent water pollution. The founding of Salt Lake City was chiefly dependent upon the discovery of an abundant supply of

crystal clear water in the mountains above, and everyone who visits there for the first time is greatly impressed by the clear, flowing water that runs down on each side of the street.

It may seem strange that in this "land-of-lakes" country, the boasted source of the Mississippi river, a city, especially when located upon the banks of the "father of waters" should have any such problems but that seems to be the case right here in the Twin Cities. Minneapolis was always fortunate in having a large supply from the river and the only problem was its purification. This was accomplished by expensive treatment and filtration plants. Now that lakes and rivers are becoming progressively more shallow from year to year, the ultimate sufficiency of the supply is prudently doubted.

The chief questions under consideration at present are the availability of an artesian supply beneath the city or the feasibility of a pipe line from Lake Superior. We know that many smaller communities get along very nicely with artesian water, but whether the basin of supply is sufficient in this case and will remain sufficiently constant in the future has not been determined. If the government would bail some water over the hill at West Duluth to the nearest tributary of the Mississippi, it might not only solve this problem but also save considerable of the nine-foot-channel-dredging expense that is now so extravagantly promised.

A. E. H.

FREDERICK TREON, M.D.

Frederick Treon was born August 12, 1857, Shelby County Indiana, died June 20, 1933, at the home of his son James Frederick Treon, M.D. at Aurora, Indiana. Graduated from the Ohio Medical College Cincinnati, Ohio class of 1879. Licensed in Dakota Territory 1887.

Served as Indian Agent and Physician; U. S. Army Medical examiner Cuban War. After twelve years service with the Government he located at Chamberlain Dakota Territory engaging in private practice. Post-graduate work at Presbyterian Hospital, Chicago.

June 29th was married to Rella Laueb.

Doctor Treon came to Dakota Territory to serve as Agency Physician for the Crow Creek Indian Reservation. The exact date of beginning this service is not available in the files of this office; however the Transaction of the Dakota Medical Society leads me to believe that he

assumed this duty at Crow Creek in 1885 or 1886.

Doctor Treon joined the Dakota Medical Society during the seventh annual meeting at Redfield, D. T. in 1888. At this meeting he presented a paper "*Surgery Among the Sioux Indians*" which was published in the transactions of the society. This paper is reprinted on page 464 of this issue.

Doctor Treon has been a consistent member during his active practice, was elected president of the South Dakota State Medical Association in 1915; was elected Councilor for the Mitchell District; served as Chairman of the Council until his retirement in 1931, when he returned to Aurora, Ind. Fellow of the American Medical Association and Fellow of American College of Surgeons.



Doctor Treon was an outstanding factor in the development and progress of organized medicine in South Dakota, giving of his time and talents in the scientific and organization programs of the Medical Association.

Fraternal affiliations: Was Grand Master of the Grand Lodge A. F. & A. M. of South Dakota in 1924; grand high priest of the Grand Chapter R. A. M. of South Dakota in 1919; Grand Commander of the Grand Commandery, K. T. of South Dakota in 1913; Grand Patron of the Grand Chapter O. E. S. of South Dakota 1919; a member of the Alpha Council No. 1., Sioux Falls, S. D.; a charter member of Chamberlain Council No. 6, and a member of St. Simon Conclave, Red Cross of Constantine.

J. F. D. C.

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ASSOCIATION

SEPTEMBER 8, 9 AND 10, 1933

Willmar, Minnesota

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PROGRAM

FRIDAY, SEPT. 8

ELKS CLUB MEDICAL MEETING
9 A. M.

- 9:00 A. M. 1. "Pre-Cancer Pathology."
Wm. A. O'Brien, U. of Minn., Minneapolis.
Discussion.
M. O. Oppegaard, M.D., Crookston, Minn.
O. J. Hagen, M.D., Moorhead, Minn.
- 9:30 A. M. 2. "The Tubercular Child."
J. A. Myers, M.D., Minneapolis, Minn.
Discussion.
A. T. Laird, M.D., Nopeming, Minn.
F. F. Callahan, M.D., Pokegama, Minn.
- 10:00 A. M. 3. "Newer Laboratory Technic."
C. R. Drake, M.D., Minneapolis, Minn.
- 10:30 A. M. 4. "The Heart in Adolescence and Old Age."
C. N. Hensel, M.D., St. Paul, Minn.
Discussion.
W. W. Will, M.D., Bertha, Minn.
J. A. DuBois, M.D., Sauk Center, Minn.
- 11:00 A. M. 5. "Arthritis."
Macnider Wetherby, M.D., Minneapolis, Minn.

SURGICAL MEETING
2 P. M.

- 2:00 P. M. 1. "Do's and Don'ts in Fractures."
R. C. Webb, M.D., Minneapolis, Minn.
Discussion.
John A. Thabes, Sr., M.D., Brainerd, Minn.
Bertram S. Adams, M.D., Hibbing, Minn.
- 2:30 P. M. 2. "Acute Conditions of the Gall Bladder."
J. M. Hayes, M.D., Minneapolis, Minn.
Discussion.
Carl O. Estrem, M.D., Fergus Falls, Minn.
- 3:00 P. M. 3. "The Surgical Treatment of Pulmonary Tuberculosis."
T. J. Kinsella, M.D., Oak Terrace, Minn.
Discussion.
Stuart W. Harrington, M.D., Rochester.
- 3:30 P. M. 4. "Common Eye Injuries."
Erling W. Hansen, M.D., Minneapolis, Minn.
Discussion.
H. N. Ruud, M.D., Grand Forks, N. D.
John J. Getz, M.D., St. Cloud, Minn.

- 4:00 P. M. 5. "Bladder Surgery."
Virgil S. Counseller, M.D., Rochester, Minn.
Discussion.
Franklin R. Wright, M.D., Minneapolis, Minn.

SATURDAY, SEPT. 9
9:00 A. M.

- 9:00 A. M. 1. "Eclampsia, Prevention and Treatment."
George Hudson, M.D., St. Paul, Minn.
- 9:30 A. M. 2. "Obstetrical Analgesics."
Samuel B. Solhaug, M.D., Minneapolis, Minn.
- 10:00 A. M. 3. "Complications of the Second Stage."
Jalmar Simons, M.D., Minneapolis, Minn.
- 10:30 A. M. 4. "The Development of Tuberculosis in the Human Lungs."
C.A. Stewart, M.D., Minneapolis, Minn.
- 11:00 A. M. 5. Film—"The Mental and Nervous Child."
N. O. Pierce, M.D., Minneapolis, Minn.

ECONOMICS MEETING

- 11:30 A. M. E. A. Meyerding, M.D., St. Paul, Minn.
Herman W. Johnson, M.D., Dawson, Minn.

2 P. M. MEETING

State Asylum Auditorium

- 2:00 P. M. "Headaches."
W. H. Hengstler, M.D., St. Paul, Minn.
- 2:30 P. M. Mental and Nervous Clinic.
W. H. Hengstler, M.D., St. Paul, Minn.
Joel C. Hultkrans, M.D., St. Paul, Minn.
Hewitt B. Hannah, M.D., Minneapolis, Minn.
L. R. Gowan, M.D., Duluth, Minn.

LUNCHEONS

FRIDAY NOON, 12:30 P. M.

Complimentary Luncheon.
Lakeland Hotel.
Kandiyohi-Swift Co. Society.

SATURDAY NOON, 1:00 P. M.

Luncheon.
State Asylum Institution.

BANQUET

FRIDAY, SEPT. 8—7:15 P. M.

W. A. O'Brien, M.D. (U. of Minn.)
Toastmaster

Short Talks

B. J. Branton, M.D., Willmar
Pres. of No. Minn. Medical Ass'n and our guests.
N. O. Pierce, M.D., Minneapolis
Pres. Minn. State Med. Ass'n.
F. J. Savage, M.D., St. Paul
Pres. Elect Minn. State Med. Ass'n.
H. H. Jensen, M.D., Atwater
Pres. Kandiyohi-Swift Co. Society.

ADDRESS

"The Uses of Poetry."
Dr. John W. Powell, U. of Minn.

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. J. Gish, Le Center, Minn., is in Chicago, where he is taking a post graduate course on oral surgery.

Dr. B. E. Brattland, formerly of Langdon, has moved to Walhalla, N. D., and opened offices for general practice.

Dr. W. J. Perry, who had been in active practice at Billings, Mont., for many years died last month from a sudden heart attack.

Dr. and Mrs. C. D'Arcy Wright, Minneapolis, have recently returned from a European trip of several weeks, spending most of their time in France.

The Scott-Carver County Medical Society held their August meeting at Shakopee, Minn., with Drs. Wetherby and McQuarrie, being the guest speakers.

Dr. Earl M. Haugrud a recent graduate of the Northwestern University, Chicago, has located at Fargo, and will specialize in internal medicine.

Dr. H. M. Hummer, Canton, was recently elected Grand Commander and Dr. N. E. Mattox, Lead, Captain General of the Knights Templar of So. Dakota.

The Southern Minnesota Medical Society will hold their annual meeting at New Ulm, on September 25. A fine program has been arranged by the committee.

Dr. W. H. Gilsdorf has purchased the interest of Dr. D. Lemieux, New England, N. D., and will continue the practice, while Dr. Lemieux will locate at Bowman.

Willmar, Minn., has decided to accept the bequest of the late Gov. Rice, and will start the erection of the new hospital on the grounds occupied as a residence.

Construction of a new hospital at Hettinger, N. D., has been started and it is expected to be completed this year. For the present, the hospital will be used only for county patients.

The N. R. A. has ruled that hospitals do not come within the recovery act's requirement of a fair competition code but may sign the president's re-employment agreements if they so desire.

Dr. Adolph Steirle, St. Paul, passed away after a long illness at the age of 66 years. Dr. Steirle was born in St. Paul, and graduated from the University of Minnesota in 1901.

Dr. J. E. Frank, formerly in practice at Cottonwood has moved to Springfield, Minn., and opened offices for general practice. Dr. Frank is a graduate of the University of Minn.

The Northern Minnesota Medical Association to be held at Willmar, on the 8, 9, and 10th of this month, have mailed out a program that should bring out a large attendance and a successful meeting.

Announcement has been made of the engagement of Miss Mildred Goldenberg, of Minneapolis and Dr. Wm. C. Bernstein of New Richland, Minn. The wedding will take place in the early fall.

Wall, S. D., are now planning on the building of a new hospital, if sufficient funds can be secured. A modern hospital is greatly needed, and would be a good investment for the citizens of that town.

Announcement has been made of the wedding this month of Dr. J. H. Tillisch, of Brookings, S. D., to Miss Marjorie Townsend of Minneapolis. Both parties are graduates of the University of Minnesota.

An impressive candlelight wedding took place last month at the residence of Dr. and Mrs. F. E. Daigneau, Austin, Minn., when their daughter, Miss Marcia, became the bride of Dr. P. H. Macfarlane of Chisholm, Minn.

Dr. H. R. Gundermann, Monango, N. D., passed away on August 10, after an illness of only a few days. Dr. Gundermann was located at Selby, S. D., for over 25 years, before he removed to Monango, where he has practiced for the past 18 years.

The narcotics permit of Dr. P. J. Cress, Ellsworth, Minn., physician, was revoked when a federal agent found him to be in possession of an over supply of narcotics. Some time ago the liquor permit at his hospital was revoked because of excessive use.

Dr. C. M. MacFall, professor of anatomy at the University of Virginia since 1928, has been elected professor of anatomy in the University of South Dakota. Dr. MacFall will teach the courses in anatomy taught by Dr. A. G. Pohlman, former dean of the school of medicine, who recently accepted a position at Creighton University.

Seven million gallons of medicinal liquor may be made in the United States next year—exactly three and one-half times the amount permitted in 1933. This increase was authorized by the bureau of internal revenue with the explanation it was required because of heavier consumption since congress relaxed the laws governing liquor prescriptions.

The Annual Clinical Meeting of the Minnesota Medical Alumni Association will be held Friday, October 27, at the University Hospital, Minneapolis. This meeting will be the day before Minnesota's Home-Coming football game with Iowa. There will be a luncheon at the University Hospital for those attending the meeting. All persons interested in attending the meeting will be welcome.

The International Assembly of the Inter-State Post-graduate Medical Association of North America will be held in the Public Auditorium, Cleveland, Ohio, October 16-20, 1933. Many distinguished teachers and clinicians will appear on the program. A major list of the names of the contributors to the program, with other information appears in the next issue of this Journal. All members of State Medical Societies are cordially invited to attend. Registration fee of \$5.00 admits all members in good standing.

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). 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 6th—"The Heart in Goiter;" September 13th—"Treatment of Diabetes;" September 20th—"Height, Weight and Health;" September 27th—"Patient and Doctor."

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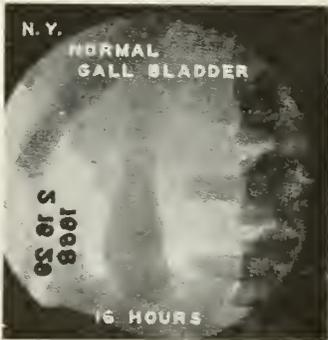
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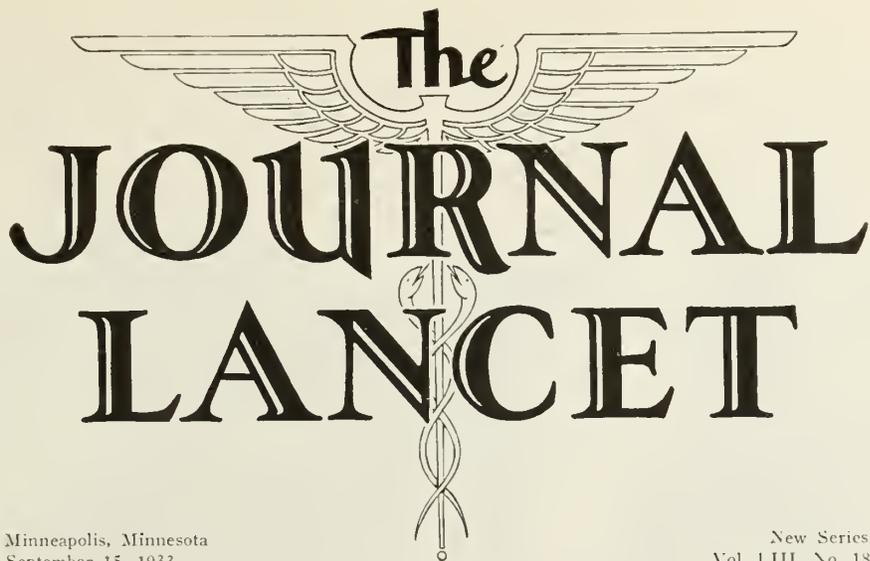
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Polyserositis, a Case Report With Unusual Post Mortem Findings

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Mitchell, S. D.

GENERAL inflammation of the serous membranes, producing a picture called polyserositis, is of uncommon occurrence.

Polyserositis, as described by most writers, is dependent upon the presence of three conditions:

- 1—Adhesive or obliterative pericarditis.
- 2—Cirrhosis of the liver.
- 3—Pleuritis—and all associated with effusion into the various serous cavities.

The case in this report is very unusual, in that:

- 1—It is a typical case of polyserositis without adhesive pericarditis.
- 2—The Post Mortem presence of primary carcinoma of the lung over three years after the disease began.

As the case report involves a discussion of the conditions present in polyserositis, the historical report of the disease is as follows: Polyserositis was not unknown to the older writers. It had attracted but little attention until described by Pick¹ in 1896, although an early case was mentioned by Van Deen² in 1846. Subsequently cases were reported by Frerichs³, Feierabend⁴, Hambursin⁵, Weiss⁶, Vierordt⁷, Tissier⁸, Hirschler⁹, Weinberg¹⁰, Mott¹¹, Variot¹², Riedel¹³, Henschel¹⁴, Harris¹⁵, Broadbent¹⁶, Dickinson¹⁷.

It was well recognized in Italy by Concato¹⁸ in 1881 and has been known in some quarters as "Concato's" disease, polyorrhomenitis or polyserositis.

In 1875, Hilton Fagge¹⁹, an English physician

reported in detail cases seen in Guy's Hospital. In 1884 Curschmann²⁰ described the now well known "Zuckergussleber" or chronic hyperplastic perihepatitis—a disease with a slow course and persistent ascites. This condition has been described briefly by Wilks²¹ and Moxon as early as 1875.

A critical résumé of the Italian Literature was written by Hager²², a German author in 1898.

Mention may be made of cases reported by Heideman²³, Hübler²⁴, Siegert²⁵, Werbatus²⁶, Nachod²⁷, Taylor²⁸, and others. It was well recognized in Italy in 1901 by Picchini²⁹, who published a paper in which he reported one hundred and ten cases, fifty of which were his own. American authors reporting cases were Osler³⁰ in 1896, Cabot³¹ in 1898, and Herrick³² in 1902. Cases were also reported by James C. Wilson³³, Physician and Chief, and John B. Deaver³⁴, Surgeon and Chief to the German Hospital, Philadelphia.

The subject has not been entirely neglected by systematic writers. In 1887 Rosenbach³⁵ wrote very fully on the subject. In 1890 Stümpell³⁶ described cases with pericardial obliteration associated with hydrothorax and without edema of the legs. He stated that the cases presenting the symptom complex are not of one nature. In 1891 Leube³⁷ wrote that pericardial obliteration gives rise to swelling of the liver and consequently ascites.

In 1894 Schroeter wrote that pericarditic obliterative symptoms give rise to ascites before the occurrence of general anasarca. Kelly³⁸, in 1903, in a remarkable monograph reviewed the

literature to date and ably discussed the various features of the disease.

In France the disease is sometimes known as "perivisceritis."

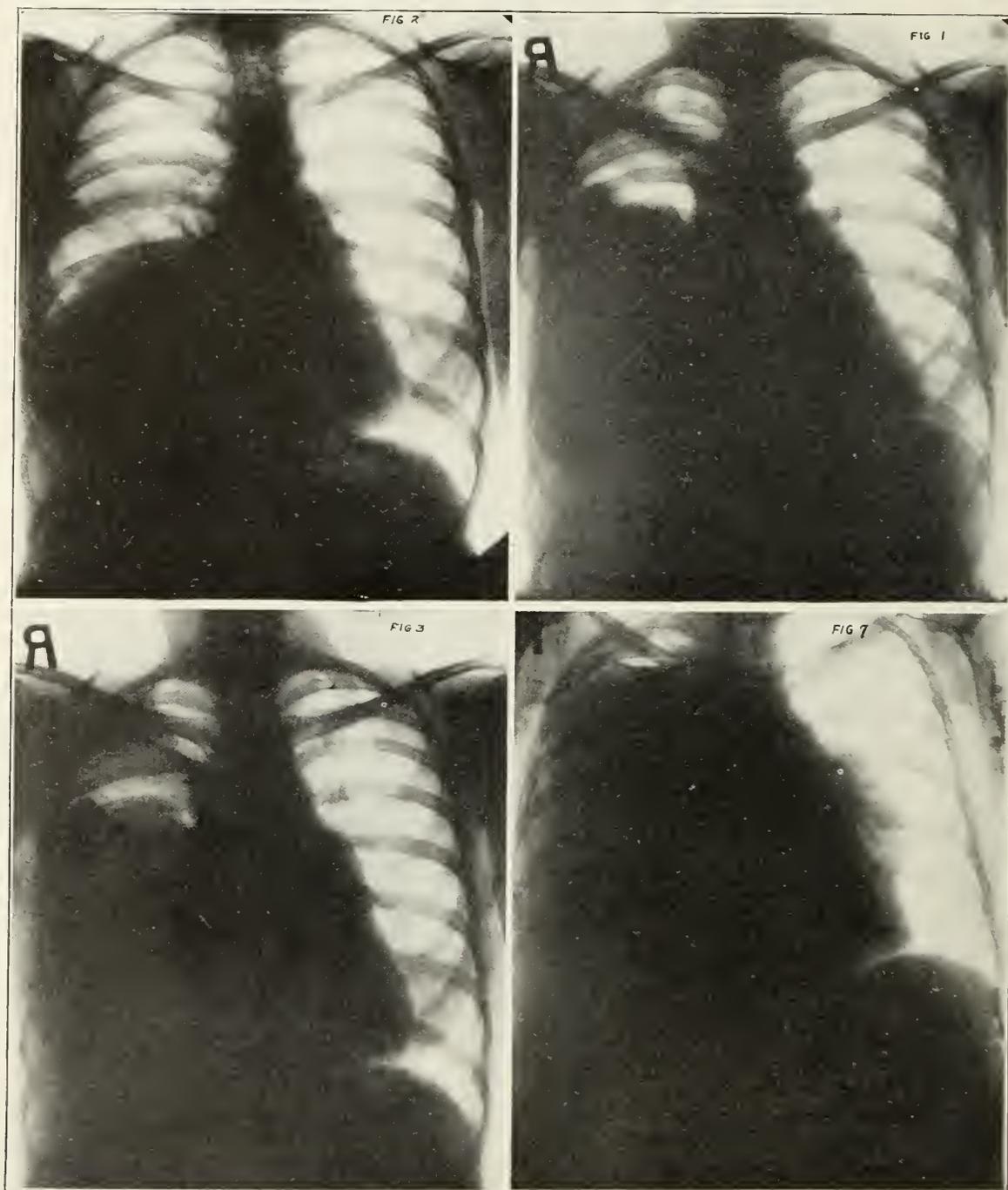


FIGURE 1—Before first aspiration. Note irregular fluid level; encysted fluid. Concentration of compressed right lung, and absence of diseased process in left lung.

FIGURE 2—Shortly after first aspiration. Note expansion of compressed lung and absence of definite lung tumor and mediastinal involvement.

FIGURE 3—Irregular fluid level. Freedom from disease in left chest and upper mediastinum.

FIGURE 7—After aspiration of chest and abdomen, two weeks before death. Tumorous mass in lung, filling almost entire pleural cavity. Note irregular heart border, height of left diaphragm and disease free, left lung. Heart shadow is superimposed on shadow of displaced tumor mass.

AGE INCIDENCE, MODE OF ONSET, ETIOLOGY,
DIAGNOSIS, SYMPTOMS AND COURSE.

It may occur at all ages. Extremes are reported from four to seventy years with an average in the forties. Kelly stresses the second and fifth decades. Sexes are effected about equally. This differs from cirrhosis which predominates in males. Chronic ascites and hydrothorax are the characteristic and dominant features. There may be a history of an acute pleurisy, pericarditis, or peritonitis months or years before the hydrothorax and ascites appear.

The mode of onset, as a rule, is gradual and insidious. If the disease begins in the chest, as it did in the case report that follows, respiration may be impaired. If it appears in the abdomen there is a feeling of heaviness and fullness. The abdomen slowly enlarges as the fluid accumulates. Subjective symptoms are largely of mechanical origin, and with all, the patient's general condition, including strength and nutrition, is surprisingly good, and they continue up and about. Their symptoms are promptly relieved by a paracentesis of either the chest or abdomen or both. Cardiac findings are commonly not striking and quite often may prove negative. The cases require frequent tapping, as the ascites and pleural effusions soon recur. Rumpf's patient was tapped three hundred and one times; in a child mentioned by Osler, one hundred and twenty-one times; in the case report that follows the abdomen and chest were tapped ninety-five times, the proportion being about two to one for the chest. There was no evidence of collateral venous circulation. The course is usually a protracted one. Nicholls³⁹ mentions a duration of two to sixteen years. According to Kelly 70 per cent of the cases live longer than two years, and 50 per cent over four years. A patient may go on for a long time in a fair state of health. Eventually death results from circulatory failure or intercurrent disease.

The diagnosis is difficult to make. Physical signs of fluid in one or more of the serous cavities in a patient that is active and in good nutrition should be carefully observed. The X-ray is an aid in early diagnosis. Late in the disease, when serous cavities are extensively involved, the diagnosis is comparatively easy. The differential diagnosis involves the consideration of cardiac disease, malignant disease of the liver, syphilis of the liver, and tuberculous peritonitis which can be ruled out by the various diagnostic methods at our command.

Apparently the only treatment that gives any relief is frequent tapping. The mercurial

diuretics such as salyrgen and novasarol, combined with ammonium chlorid, are of very little value. In cases of suspected malignancy radiation therapy should be tried. Surgical treatment has not been a success, patients usually dying of fatal peritonitis. Venous anastomosis has been recommended, but very little is written about this form of treatment.

Very little is known about the actual exciting factors. The best explanation that has been offered is that there has been an infection by an organism of low virulence, but capable of provoking marked fibrosis in a serous membrane with a lowered resistance, inherent or acquired. Among the bacteria that have been suggested as a cause are: *Bacillus coli*, typhoid bacillus, tubercle bacillus, influenza bacillus, and a rheumatic type of infection, but cultural proof is lacking.

PATHOLOGY

The great differences of opinion in relation to the pathology present, and the many pathological pictures reported by the various observers, in the dissimilar cases cited, shows a disease very general in character. One condition common to all cases is a chronic proliferative inflammation of the serosa with all its forms of variations and relations to one another. This condition is most marked in one case in the pleural cavity, in another the peritoneal cavity, and in a third the pericardial sac. A marked amount of fluid in these various serous cavities is about the only finding that is common in all cases.

The greatest involvement is shown over the surface of the liver and spleen. Pathological and clinical variations have given rise to a large number of descriptive terms, synonymous or nearly so, some of which are—chronic obliterative pericarditis with ascites; pericarditic pseudocirrhosis of the liver (Pick); iced liver; (Zuckergussleber of Curschmann); chronic deforming perihepatitis; capsular cirrhosis of the liver; multiple serositis; polyserositis; polyorhomenitis; multiple progressive hyaloseritis (Concato, Nicholls); simple diffuse chronic peritonitis; chronic proliferative, indurative or exudative peritonitis. It is very difficult to show that the disease begins primarily in any one organ, but can be considered more as a systemic infection with clinical manifestations limited to a small group of organs and principally those organs that have a serous membrane cover—the case that is reported is one exception, as will be shown later. It is quite evident that the disease is not primarily a liver condition and one important

point is constant in all cases, viz., very slight or no edema of the legs.

It is interesting to note the opinions of the earlier writers as to the cause of the ascites:

Weiss believed it was due to changes in the blood vessels of the peritoneum—the result of chronic peritonitis and that transudation of serum occurs more readily from the altered vessels of the

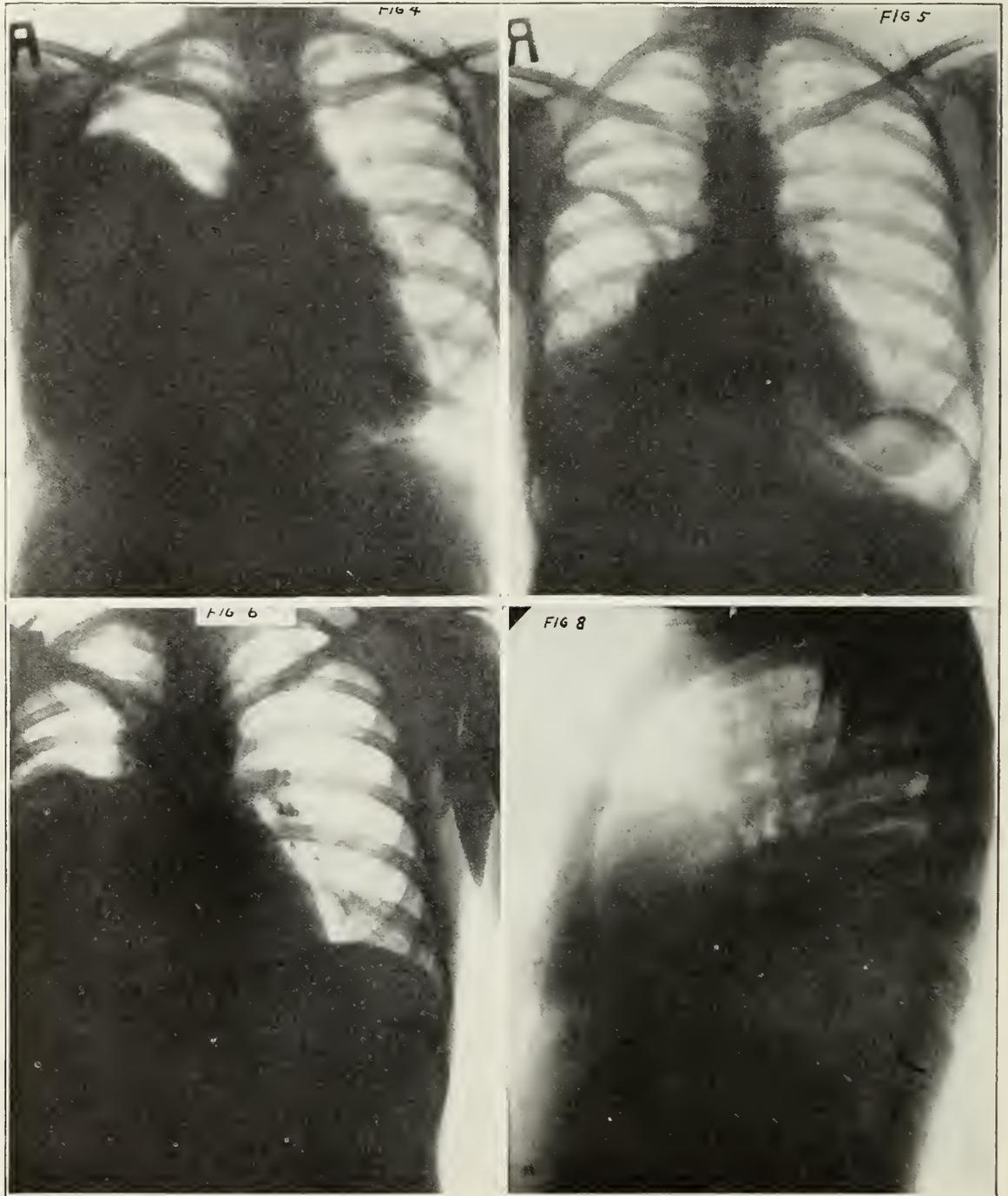


FIGURE 4—January 23, 1930, before aspiration. Irregular fluid level, thickened mediastinum, irregular border of heart.
 FIGURE 5—January 25, 1930, two days after aspiration, showing lung partially replaced by a mass in lower chest with recession of heart shadow to right. Right lung still free from disease.
 FIGURE 6—February 22, 1930, after aspiration. Lung being replaced gradually by tumorous mass. Heart shadow fairly normal in size. Mediastinum thickened. Note height of diaphragm on left, due to abnormal ascites.
 FIGURE 8—Lateral view of chest, February 22, 1930, shows fluid level with absence of tumor in posterior mediastinum.

peritoneum than from the other vessels of the body; that in consequence of the development of the ascites, venous congestion in other parts of the body is relieved and the development of edema more or less prevented.

Weinberg attributed the ascites with little or no edema of the legs to angulation of the inferior vena cava or the hepatic vein due to a right-sided pleural effusion. He cited some experiments of Rosenbachs that appeared to show that such right-sided pleural effusion may cause angulation of the vena cava and congestion of the portal system. This idea was exploded by Pick, who pointed out that it was difficult to conceive of isolated compression of the hepatic vein, and compression or angulation of the inferior vena cava without edema of the legs. Furthermore, in many of the cases there is no right-sided pleural effusion.

Rosenbach, while scarcely venturing to express an opinion on the subject, states that the ascites cannot be the result of simple insufficiency of the heart muscle, and he attributes considerable importance to the fibrous alterations in the liver capsule.

Harris states: "There are two lesions, either of which may possibly occur as complications to the mediastinal and pericardial affections, and which could explain the ascites in such cases. The first is chronic venous congestion of the liver—a secondary periportal cirrhosis. The second explanation is that a chronic peritonitis ensues and to that the ascites is due."

Kelly states that the chronic peritonitis theory of Harris may possibly be an independent infection, and one directly connected with the mediastinal lesion.

W. J. Mayo⁴⁰ states that it may be caused by some type of bacteria which affects the serous surfaces only, and cites Rosenows work on the specificity of bacteria.

To summarize—three opinions are put forth by as many different groups of writers; the first, represented by Pick, Bogzolo, Nochod, Galvagni, Cabot and others, attributes the ascites to the changes in the liver, the result of long standing congestion; the second, represented by Weiss, Heidemann, Shupfer, Werbatius and others, attributes the ascites primarily to chronic peritonitis; and the third, represented by Harris, Coles, Puella, Siegert, and others, attributes the ascites to the combined action of both these factors. Kelly states that the feature possessed by the cases in common, therefore, is widespread disease of the serous membranes, and the most common lesion is chronic hyperplastic serositis.

In the case report that follows the right pleura was involved first, then the peritoneum and very slight involvement, if any, of the pericardium, and no involvement of the left pleura. The primary exciting cause of the multiple serositis in general has occasioned considerable discussion. Certain of the infectious disease, such as typhoid, pertussis, influenza, malaria, syphilis, and rheumatism are given as etiological factors. In a number of cases the provoking agent was the tubercle bacillus. A few of the writers have mentioned low grade malignancy.

THE CASE REPORT

The patient is a woman, age thirty-six housewife by occupation. She presented herself in the office on June 22, 1929 with the following complaints: pain in right chest at about the level of the right breast, which had a boring tendency to the back and had been present for two months; shortness of breath on exertion for the past three or four months; loss of appetite with a twenty-five pound loss of weight during the past six months; moderate diarrhoea; there was no coughing, vomiting, palpitation of the heart, or swelling of the lower extremities; her family history is essentially negative; obstetrical—one child born nine years ago, no sequalae, no miscarriages; childhood negative; had always been well and healthy until December, 1928, when she had a severe attack of influenza lasting two weeks.

The physical examination made June 22, 1929—a tall, fairly well nourished, middle aged woman, weighing 140 pounds, skin dry and rough.

Chest—right, decreased mobility. Dullness to level of third rib with definite signs of hydrothorax. Heart dullness increased to left. Otherwise, heart is negative. Left chest is normal. No temperature, no cough.

Abdomen—Liver dullness extends about two fingers breadth below costal arch on right side. Upper border of dullness is merged with fluid dullness in thorax; liver dullness practically normal on left side; some slight tenderness in gall bladder region; spleen is not palpable; no ascites present; balance of abdomen quite negative. Pelvic organs—some slight tenderness of uterus, tubes, and ovaries when moved. Otherwise, quite negative.

X-ray examination of chest—fluid level fourth rib, heart pushed to left. Right thorax was aspirated June 24, 25, and 26, removing a total of 2,000 cc of straw colored fluid with

a specific gravity of approximately 1.015, containing between two and three per cent of albuminous material, thereby placing it in the class of inflammatory exudates.

Guinea pig inoculations of the chest fluid were made at three different occasions, and all were negative for tuberculosis.

The chest was aspirated at intervals of every few weeks. On December 20, 1929 she became so uncomfortable from abdominal distention, which had been developing gradually over a period of two months, that it was deemed necessary to aspirate this cavity. This was the first abdominal aspiration and 1,800 cc was obtained, the fluid having the same characteristics as that obtained from the pleural cavity. Several guinea pig inoculations were made at different times from the abdominal fluid and all were negative for tuberculosis. Moderate sized irregular masses were palpable in the abdomen after the first aspiration. The tubes, ovaries and uterus were contained in one pelvic mass that was moderate in size, hard, and scarcely movable. The bladder, rectum and sigmoid were free.

Abdomen—liver two fingers breadth below the costal arch on right, normal on left. Spleen not palpable. Moderate amount of shifting dullness in flanks. Moderate amount of fluid

in the abdomen. Extremities negative for varicosities and edema.

Additional complete physical examination was made in June, 1930, which is as follows: definite right hydrothorax, dullness extending to the midscapular region posteriorly, third rib anteriorly.

Heart was pushed to the left and apex beat was about the mid-axillary line. The abdomen was distended and a definite fluid wave was present. No masses were felt because of the distention. Examination of the pelvis revealed a rather marked mass, posterior, that seemed to push the uterus up behind the symphysis. Examination of the rectum showed marked infiltration and induration of the rectal wall, with a nodular wall almost entirely surrounding it. This mass felt as though it were composed of glands. Proctoscopic examination showed no ulceration. The lesion was apparently extrarectal.

Blood examinations were made during the course of the disease, showing the usual features of a moderate simple anemia and the differential cell counts were well within the normal limits.

The blood Wassermann was entirely negative. The urine remained entirely negative throughout the course of the disease.

It was impossible to make a definite statement as to the cause of the polyserositis. Lymphoblastoma was considered. Tuberculosis was well ruled out by guinea pig inoculations. A low grade malignancy appeared in the picture, but superficial glands being absent it was impossible to obtain one for diagnosis. Following the findings of June, 1930, she received two complete courses of massive doses of X-ray to chest and abdomen without apparent relief. Aspiration of abdomen and chest was continued at frequent intervals until her death on July 2, 1932. This fluid was removed for a total of ninety-five times, the proportion being about two to one in favor of the chest. With removal of the fluid she remained fairly comfortable until the last three months of her life, when she developed severe pressure symptoms, tachycardia, extreme shortness of breath, exhaustion and cachexia, and the last four weeks of her life she required moderate doses of morphine for pain.

Notes from the progress record show some unusual outstanding features of the case: the comparative freedom of distressing symptoms

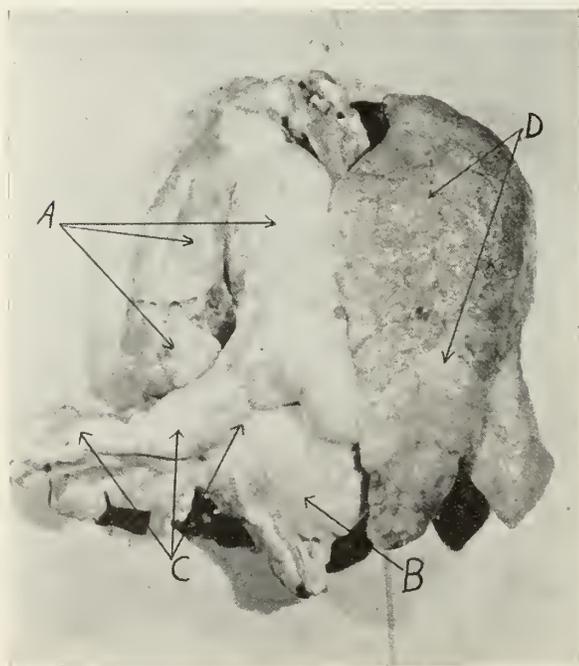


FIGURE 9—Photograph of thoracic organs removed at autopsy showing (A) Tumorous mass replacing right lung and mediastinal contents; (B) Practically normal sized heart; (C) Extreme thickness of diaphragm with adhesions to pericardium; (D) Practically normal left lung.

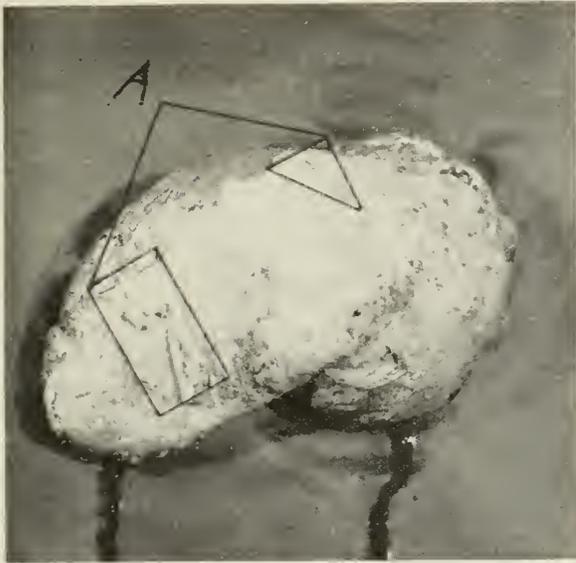


FIGURE 10—Photograph of spleen (A) Dense covering composed of fibrin and partially organized tissue, "cake icing" of Curschmann.

until very late in the course of the disease; the maintenance of good nutrition until the last three months of her illness; the performance of household duties until late in the course of the disease; the gradual replacement of the lung by a tumorous mass; the absence of jaundice, edema and superficial collateral circulation during entire course of disease; the comfort and feeling of "well being" after the aspirations, and particularly in the face of such extensive disease of the pleural and abdominal cavities.

THE POST MORTEM EXAMINATION

The body is extremely emaciated. The mouth, throat, and pharynx do not present anything of importance. The neck does not present enlarged glands or enlarged thyroid. The trachea is normal in size and contour and bifurcates in the usual location.

The Lungs—Right lung is a contracted and compressed tumor mass, held tightly against the spinal column by a large amount of liquid of a syrupy consistency, containing flakes of fibrin, and the surface of this mass is covered with a white exudate very similar to "cake icing." The right pleural cavity is very much enlarged and a definite pouching of the visceral pleura extends across the anterior mediastinal space, covering about one-half of the heart. This pouch also contains fluid as above described and is very densely adherent to the mediastinal contents and the pericardium, so much so that it is impossible to separate these

structures. The parietal pleura is thickened and very difficult to dissect. The right bronchus is somewhat reduced in size by external pressure, but is open. Gross examination does not show any air cells in this tumor mass. The diaphragm is very thick, averaging three cm. and densely adherent to the tumor mass in the right chest, corresponding to the lung.

Left lung—quite normal in size and location, and bronchii open. The left pleural cavity is free from adhesions and fluid. The pericardial sac contains about four times the normal amount of fluid. This fluid is clear. There are no adhesions within the pericardial sac. The heart is quite normal in size and the valves are competent.

GROSS DESCRIPTION OF THE RIGHT LUNG ON CUT SECTION

Lung is reduced less than one-half in size. It presents a resistant, coarsely granular surface. The mediastinal tissue is much thickened, has a somewhat gelatinous consistency, and is strongly attached to the lung and the portion of the pericardial tissue in contact with it. There is no apparent infiltration of the pericardium by the tumor process. The lung cuts with increased resistance. It is completely airless and presents a thickened, infiltrated pleural surface which appears as a white glistening line. Glistening nodules are found in various portions of the lung. There is a very extensive distribution of the tumor mass around the bronchii. The hilus lymph nodes are involved.

The cut surface of the tumor has a mucoid appearance and cysts containing mucoid material are found in various portions of the mass. There is nothing of importance to note in the left lung, except some slight post mortem changes.

The abdomen—This cavity contains a large amount of fluid, gelatinous in consistency. The stomach is normal. The peritoneum shows changes that vary in degree from a slight thickening and opacity to the presence of a wide spread exudate which encases the viscera in a dull white or pearly coating, irregular in distribution, that has the appearance of "cake icing."

The liver is enlarged about one-third on the right side. The surface is smooth, but covered with a thick white exudate, similar to "cake icing." The superior surface of the liver is adherent to the thickened diaphragm.

On cut section there is considerable thickening of Glisson's capsule.

The gall bladder is normal. The spleen is slightly enlarged and covered with a thick white exudate, similar to "cake icing." The duodenum is normal except that it is bound down in an inflammatory mass which involves the omentum, the mesentery and the mesenteric glands. The great omentum is very thick, contracted, full of nodular tumors, and thickly covered with "cake icing." The mesentery is thick, nodular and covered with "cake icing." The intestines are thick, intensely matted together, and covered with small, white plaques, similar to "cake icing." The uterus, tubes, ovaries and pelvic glands are in one mass which surrounds the rectum and sigmoid colon. This mass is very nodular, impossible to identify its component parts and is well covered with "cake icing." All of the above organs are surrounded with thick liquid of a gelatinous consistency. The kidneys are normal.

THE MICROSCOPICAL EXAMINATION

The pleura shows considerable fibrosis, very dense and hyaline, with a diffuse scattering of inflammatory cells, particularly lymphocytes. The presence of fairly large round or cuboidal cells, most of which present definite alveolar or papillary arrangement. For the most part these cells appear in several layers, but in some places, they appear in a single layer.

Nodules within the tumor mass present practically the same appearance.

The mediastinal tissue presents the same appearance for the most part, but some areas show marked degeneration of tumor cells. Mediastinal and peribronchial lymph nodes

show the same type of involvement, but the glandular arrangement of cells is more marked.

The liver shows some parenchymatous degeneration of the cells, and thickening of Glisson's capsule, which shows a large deposit of fibrin and partially organized tissue.

The spleen shows a very dense covering, composed of a large deposit of fibrin and partially organized tissue, much more pronounced than in the liver. Otherwise, the spleen is negative.

The intestines, omentum, mesentery, mesenteric glands and pelvic organs are covered with a thick exudate that has the same microscopic appearance as the covering of the spleen and liver, and in addition the deforming characteristics present in chronic inflammation.

MICROSCOPIC DIAGNOSIS

Primary Adenocarcinoma of pulmonary origin⁴².

From knowledge gained from personal experience, and by reviewing the published data the following summary is offered:

The disease has a definite selectivity for certain serous cavities, as not all of these cavities are involved. Therefore, the name "Polyserositis" is not descriptive.

Two conditions are common to all cases, viz., chronic proliferative inflammation of the serosa and the abundant formation of exudates by these diseased membranes.

Bacteriological studies of this disease are lacking, principally because of the inaccessibility of the lesion; but the idea of "specificity of bacteria" enters very strongly into the general picture of the disease.

The post mortem presence of adenocarcinoma, primary in the lung, suggests the etiology of the disease in the case reported, nevertheless, it is

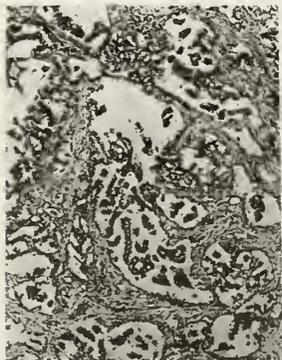


FIGURE 11—Photomicrograph of lung nodule (x65).

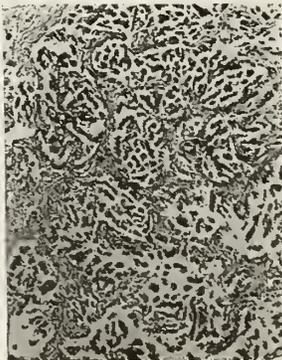


FIGURE 12—Photomicrograph of mediastinal nodule (x65).



FIGURE 13—Photomicrograph of section through thickened pleura (x250).

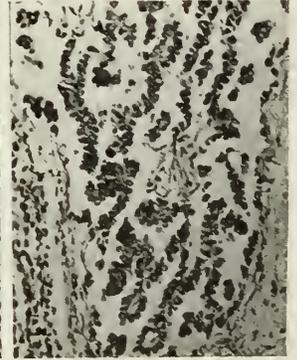


FIGURE 14—Photomicrograph of section through thickened pleura (x190).

hard to conceive of a primary carcinoma existing in the lung over a period of forty-four months. The theory of irritation as the cause of cancer is also to be considered, the cancer being ingrafted on a previously damaged serous membrane.

It is remarkable to note the freedom from distress until very late in the disease, when the extent of the involvement of the serous membranes is considered.

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Concerning New Developments in Tuberculosis Control*

Arnold S. Anderson, M.D.**
St. Paul

THE philosopher, Herbert Spencer, once said: "When a man's knowledge is not in order, the more of it he has, the greater will be his confusion." Being fearful of the truthfulness of this proverb, I concluded that it was near time to put in order some of our recent work in tuberculosis so as to militate against confusion.

New knowledge in medical science has come so fast and so profuse during the past years that it has been impossible for any one of us to weigh all of it carefully. How much of it will stand the test of time is yet to be seen. Much will fall by the wayside while some will continue as having lasting value. That our present knowledge, however, is more dependable than that of ancient times seems safe to assume for the reason that now critical science must pass on its virtue while previously dogma accepted or rejected it.

In considering the new developments in tuberculosis control, let us for the sake of order view them under the following headings:

1. Epidemiology.
2. Surgery.
3. Laboratory.
4. Medicine.

To avoid confusion, let us treat each new step from the standpoint of *What*, *Why* and *How*. Of *What* does it consist; *Why* is it being done; *How* is it carried out and *How* good is it? By so dealing with the subject, we shall hope not to disturb the spirit of Spencer.

First, we face the field of Epidemiology. This is not a new field, but some of the methods we are now using in it are new. *What* is recent here? It is the modern attempt to find and remove sources of infection and to discover early cases through the tuberculin test and the X-ray. That sums it up as briefly as it is safe to give it. *Why* do we do it? We are attempting to "close in" on all sources of infection so that tuberculosis will cease to spread. Tuberculin is a splendid detective. When its reaction is positive, particularly in a young child, we can be quite certain that a spreader of this disease lurks close in the background. As the child grows older, makes

more contacts, and inhabits a larger environment, the value of the tuberculin test as a detective is greatly reduced. The field of operation becomes too great. But while the child remains in its home environment and then develops a positive reaction, search closely for the spreader in the family group. Only too frequently we have found that a parent, grandparent, or maid suffering from a chronic bronchitis of years standing has been unsuspectingly feeding tubercle bacilli to an innocent child.

How is this work carried on? As a sanatorium program, we have adopted two methods: 1. The School Survey. 2. The Family Survey.

In the School Survey, we test the children, X-ray the positive reactors, and look into the family circle for possible spreaders.

In the family survey, we have a list of reported tuberculosis cases from the State Board of Health and a list of past and present sanatorium patients. From these, we pick the families requiring investigation.

The tuberculin test employed is the Mantoux. O. 1 cc of a 1-1000 dil. of O. T. is given intracutaneously on the inner aspect of the forearm. In 48 hours, it is read. To be positive, it must be red, indurated, and in size larger than 0.5 cm in diameter.

How valuable is the work? It has met with national and international favor. As an example of its efficacy, let us mention the results in our county tuberculosis sanatorium districts for the past two years. During that period, 42,738 children have been tested. Sixteen per cent have reacted positively; 809 childhood and 110 adult types of tuberculosis have been found, and 79 new and unsuspected sources of infection discovered. Whenever I learn that a new and unsuspected source of infection has been brought to light, I feel that real progress had been made. During the past spring, in one of our sanatorium districts, 13 adult types of tuberculosis were found in school surveys and four spreaders of disease were newly discovered. With such results, there can be no doubt as to the value of this type of work.

In the field of surgery, there have been many notable advances during the past few years. They have occurred in the specialized phases of col-

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lapse therapy as thoracoplasty, phrenic exeresis, pneumolysis, and pneumothorax. *What* are these advances. In thoracoplasty, phrenic exeresis, and pneumolysis, they are mostly in the form of improved operative technique, a better selection of patients, and more careful pre-operative and post-operative care. The combining of one with the other of these operations have proved useful. For instance: it is desirable to perform phrenic operations on most all contemplated thoracoplasties. It is held wisest to proceed the thoracoplasty by the phrenic exeresis by a few months period of time. *Why?* Because: 1. It helps to immobilize the lung; 2. By preceeding the major operation with a phrenicectomy as described, there is given in many instances sufficient immobilization and collapse of the lung to obviate the necessity of a thoracoplasty. The combination of pneumolysis with an upper stage thoracoplasty has recently come into vogue for the collapse of adherent apical cavities.¹ *Why?* Because thoracoplasty alone frequently fails to collapse them effectively and, unless completely collapsed, the best results are lacking. Modern experience has shown that thick-walled cavities are more difficult to close than thin-walled ones. This is well to remember when considering a case for callapse therapy and contemplating its possible outcome.

How valuable are these special operations? They serve the one most useful purpose of closing cavities that otherwise would remain partially open and continue to discharge tubercle bacilli and to give toxic symptoms. The literature contains ample evidence vouching for the success of these operations in selected cases.

Pneumothorax therapy has continued to gain in favor. *What* is new in this field? The one thing that stands out in my mind is the use of pneumothorax for those patients that have refused bed rest and are determined to remain ambulatory. The use of this treatment in these cases has recently been reported upon by Hruby, Kirch, Cutler, J. A. Meyers, and others². The results have been definitely encouraging and show us that in selected cases prolonged bed rest is unnecessary. The patients have continued on their jobs while their lesions were being brought under control by fequent pneumothorax refills. It must be remembered, however, that all pneumothorax cases are not suitable for this type of treatment. The selection of them must be carefully made.

Why this form of treatment? As stated before, it must go to those suitable cases that refuse bed rest. It is also used in those localities where

sanatorium facilities or bed rest are not available and necessity urges this as the best alternative.

How is it carried out? If possible, a few days or weeks of hospital or sanatorium stay is desirable for the first refills. However, where this is impossible, air is given once or twice a week at the office or at the home, advising, of course, as much freedom from strain in the life of the person as is deemed necessary.

How valuable is it? When used for the aforementioned indications, it fills a real need. It not only helps to save the patient physically, but financially, in that it permits him to continue his occupation and obviates the necessity of spending large sums of money for bed rest. It serves the community by making, in many instances, positive sputum cases negative and thus closes avenues of infection.

Oleothorax is a comparatively recent adjunct in the treatment of tuberculosis. It consists of the injection of oil (gomenol 1—10 per cent in mineral oil) into the pleural cavity. *Why* is it used? Its indications are summed up by Ray Matson as follows:³ "1. As a disinfection oleothorax; 2. To inhibit the expansion of the lung in a threatened early obliterative pneumothorax, and 3. as a compression oleothorax to re-establish collapse, or for the purpose of collapsing rigid-wall cavities in which an intrapleural pneumolysis is impossible."

How is it used? The technique calls for a one per cent gomenol in mineral oil for inhibition or compression purposes and five to ten per cent for disinfection. In the former case, quantities of 20 cc of the one per cent oil are injected into the pleural cavity and an equal amount of air removed until 100 cc of oil has been administered. The dose is increased at subsequent monthly sittings up to, not more than 400 cc each time or until the desired result is obtained.

For disinfection purposes, much the same technique is used except that pus aspiration and irrigation is first done. The description of this method is hardly complete enough for purposes of practice. For that, Matson's article in the *American Review of Tuberculosis*, April 1932, should be consulted.

How valuable is it? Matson's report as well as that of many others shows favorable results. The success of it depends of course on the selection of patients and the technique used. This procedure has not as yet stood the test of time, as pneumothorax has, and so caution must be exercised as to final pronouncement on it.

A recent operation called scaleniotomy has been introduced for collapse of adherent apical cavi-

ties. Descriptions of it are given by Mead Clyne⁴ and Lincoln Fisher⁵ in the December 1932 issue of the *American Review of Tuberculosis*.

It consists of cutting the fibers of the scaleni muscles, which support to a great extent the first and second ribs. This brings about a more or less efficient immobilization of the upper chest, but the best results apparently are obtained in combining it with a phrenic exeresis.

Why is it done? 1. To effect more complete collapse of apical lesions when pneumothorax is insufficient. 2. As a preliminary to paravertebral thoracoplasty to induce a more effective upper lobe compression.

How is it done? An incision is made quite similar to that in phrenicectomy. The underlying structures are dissected away and the fibers of the scalenus anticus, medius, and posticus are severed. The phrenic nerve found in the course of the operation is removed.

How valuable is it? In Clynes, 52 scaleniotomies, 31 were definitely improved. In Fisher's 31 cases, most of them were helped. It is perhaps too early to evaluate properly the usefulness of this operation, although its present promise in selected cases does seem encouraging. Historically it is a young operation having been introduced into Europe by Kochs, Els and Junkersdorf in 1930 and in America by Gale and Middleton in 1931.

In the laboratory and X-ray fields, there have been three advances in particular that have attracted much attention.

1. The Arneth-Schilling shift to the left.
2. The blood sedimentation test.
3. The use of the paper film in X-ray work.

The Arneth-Schilling shift to the left is a phenomenon observed in defferential blood counting using the Wright stain technique. The principle back of it is based on the changes that occur in the neutrophilic leucocytes during certain diseases. These neutrophiles are divided into various classes depending upon whether they are regenerative or degenerative in character. If the regenerative cells predominate, it is considered a shift to the right; if the degenerative ones are increased, the shift is to the left. That is very, *very* briefly the essence of the test.

Why is it done? It has been shown that various active infectious diseases, tuberculosis among them, show a preponderance of degenerative neutrophiles. As healing occurs, a balance of the regenerative and degenerative types is restored. It is done therefore to help determine the presence or absence of activity in a given disease.⁶

How is it done? Differential blood counts are

made on a slide under Wright's stain. Familiarity with the various types of neutrophiles is of course essential so that the proper classification can be made.

How valuable is this count? It is coming to hold a definite place in our tuberculosis work. Many sanatoria are now using it as an aid in the detecting of activity. Our past experience has led us more and more to search for the earliest possible evidence of active disease. We are quite likely approaching an era when such clinical signs and symptoms as fever, loss of appetite, loss of weight, etc., will be considered advanced indications of activity and that more delicate criteria will be used. The described test is a trend in this direction. It aims to point out pathological activity before clinical signs and symptoms have developed.

The blood-sedimentation test for determining activity of tuberculous lesions has undergone modification from time to time. It is based on the principle, long observed, that red blood cells settle, in vitro, more rapidly in some diseases than in others. It is not specific for any particular disease. It is only specific in showing pathological changes in whatever disease may be present.

Why is it used? Its purpose is to detect pathological activity before clinical symptoms have appeared. It has been found that an active disease process as occurs in tuberculosis, causes an increased rate of settling of the red blood cells. It therefore should help us to better evaluate the patients true condition.

How is it used? The Burke technique which is in common use to-day is too detailed to describe here. I will merely state that a tube 100 mm in height is used for the prepared blood specimen and that the period of most rapid settling is considered and the result recorded in millimetres per minute.

How valuable is it? Spector and Muether draw the following conclusions in their article in the April 1932 issue of the *American Review of Tuberculosis*⁷.

1. "The Rourke method is the most accurate blood sedimentation method yet devised for studying clinical as well as pathological activity, and is superior to the thermometer or the total leucocyte count in this regard."

2. "The tests are not specific, as the sedimentation is rapid in other diseases, and do not give any information as to extent of disease, except perhaps in a general way. However, they are of great aid in prognosis and diagnosis, in the sense that they detect infection."

A new step in the X-ray field of tuberculosis consists in the use of the paper film for X-raying large numbers of people at a relatively low cost. Now there is still a question in the minds of the roentgenologists as to whether this constitutes a forward or a backward step. The reason for it is that the paper does not show up detail as well as the celluloid film and so its use may lead to diagnostic inefficiency. In an article on this subject in the June 1932 issue of the *American Review of Tuberculosis*, Bernard, Amberson and Loew⁸ hold that the range of error is only slight and they defend the use of the paper film because of its lower cost and its suitability for school survey work.

Why is it used? 1. Because its cost is only about one-half that of the celluloid film. 2. It permits of more rapid and more extensive X-ray field work. Dr. J. A. Myers in his articles in the *Journal of the American Medical Association*, June 24, 1933⁹, points out the fact that "the present equipment for making X-ray films is too slow in operation for the increased demands for greater numbers of X-ray examinations. The new, rapid X-ray camera meets the demand by making with ease from 500 to 1,000 exposures a day."

How is it carried on? Special attachments to standard X-ray equipment is required for the taking of the rapid exposures mentioned above. In field work, the equipment is put up at a centrally located place and X-rays of positive tuberculin reactors made. The paper films for this work come in rolls and so permit of a rapid technique both in exposure and development.

How valuable is it? It is still a very new procedure and requires time to test it. As an aid in epidemiological work, however, it certainly appears promising, not from the standpoint of picking up questionable cases, but for finding advanced cases that are spreaders of disease, these to be found by the X-raying of large numbers in a relatively short time. Dr. John Rice, health officer of New Haven, Connecticut, reports the use of this film in 6,400 school children, all of whom were X-rayed within a period of eleven school days and points out the speed and low cost with which this was accomplished.

In the medical field, one of the interesting recent contributions has been the application of diet to the treatment of tuberculosis. Experimentally, much work has been done showing the relationship of vitamin deficiencies to the development of tuberculosis in animals. The use of the Sauerbruch-Gerson diet in lupus cases particularly has shown much promise. *What*

is this diet? Its essential features are the following:¹⁰

1. A low sodium chloride content.
2. A large percentage of raw fresh vegetables and raw fresh fruit.
3. Preparation of cooked vegetables in their own juices in waterless cookers.
4. Marked restriction of meats.
5. Restricted water intake, with liberal amounts of fruit and vegetable juices.
6. A mineral compound chiefly of calcium and magnesium salts.
7. Cod liver oil.
8. Rich fat and protein, but low carbohydrate foods.

Why is it used? The purpose is to so alter the chemistry of the body tissue as to make it unfavorable soil for the tubercle bacilli and to raise the resistance of the body, making it better to cope with the invader. The exact measurements of these changes is at present impossible. The best that can be done is to observe clinically, and under proper controls, the results of the diet.

How is it used? Menus have been developed containing the essential food elements required and can then be administered either in the institution or at home.

How valuable it it? In Lupus cases, leading authorities report very favorable results. It also seems to exert a favorable effect upon other extra pulmonary tuberculous lesions. Up-to-date, however, it has not shown any striking effect upon pulmonary phthisis. Even so, when one reads the enthusiastic comments made by workers who have used the diet for lupus vulgaris, one cannot help but feel that it represents a real contribution to our therapeutics.

Time does not permit us to give fair consideration to the many other medical problems and advancements that have recently come to light. Let us briefly mention them.

Much has been said and done about Calmette's BCG vaccine. Up to the present time, it has not met with complete acceptance. In Europe, it has been extensively used and to some extent in this country. In Turkey, it has risen to the dignity of becoming a compulsory vaccination for children. The great present day objection to this procedure is the possible danger of these attenuated tubercle bacilli becoming virulent after a prolonged stay in the child's body. Calmette maintains that this will not happen; others hold that it is possible. And so it stands until thou-

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The Services of the County Public Health Nurse*

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IT IS our good fortune to live in a great rural state, and the problems that confront us are vastly different than that of the visiting nurse in a congested city, but the very vastness of our prairies, and the magnificent distances that separate our rural communities bring about new and different problems, not from congestion but from isolation, and sometimes not so much from an intimate contact as from the very lack of it.

The conditions in this bread basket of the world have been in many instances most unfortunate this year, due in some measure to the wonderful fertility of the soil which has brought about a condition most peculiar, in which we have raised such an abundance of food stuffs that the world has not been able to assimilate it. It has brought a stagnation of markets for these products, and has thus indirectly reflected back on the earning capacity of our people, thereby bringing hardships in a material way that has crippled industries and schools with their interlocking activities, and embarrassed the very existence of our old established usages and customs.

The health of our people, in spite of these hardships, has never been better. They have shown a courage in the face of the catastrophies that have been doggedly piling upon them; that is almost beyond belief. Their courage today, with the gloomy outlook for the coming season is contagious, and is even a reserved optimism tempered with fortitude.

There seems to be a reason for this. In the more prosperous years in which we lived easily, and worked and played with abandon, and took no care for the morrow, our habits of living and our very freedom of motion precipitated on us dreadful epidemics that spread like wild fire, and claimed lives by the thousands due to the swarming contacts that were made and the extremely low resistance that our fast living and over-eating had brought about.

The last year or two has brought about a change. People are sobered and serious, and are working industriously to solve the problems that have suddenly threatened to overwhelm them; taking away homes, wiping out the little fortunes that have been a lifetime in the making, and it is the most opportune time that our profession can

be of the greatest service to them in their dire necessity. For the time has come when the problems of actual want and the diseases and conditions that accompany actual starvation in the land of plenty, have come to our attention many times during the past year. The treatments of children ill fed, with unbalanced diets, and lack of clothing sufficient to warm their chilly bodies, is one of the uppermost problems that we are called upon to contend with these recent years.

I am impressed with the fact that the resistance of our children is slowly running down. We are not confronted with the problems now of high and riotous living but with the very reverse. The conditions of malnutrition are becoming more and more numerous and this brings us to the point that we should be ever zealous to battle with the preventive measures that we have at our command, and to keep our little charges free from the conditions that are sure to come on them when they are least able to cope with them.

It has been the object of our unit this year to impress upon our school officers that the need of preventative measures is now most urgent. We have conducted a vigorous campaign for the immunization of the schools for diphtheria, and have met with considerable success. It is to be regretted that we have not been able to make our immunization 100 per cent, but we have made very great progress, and the education of the parents in these preventative measures has been very enlightening.

In the years preceding it has been the experience of most of us that preventative measures have met with some resistance, even organized and at times militant resistance, but it has been my experience that where we have taken the time to painstakingly explain to our patrons the need and necessity of preventative measures that it has met with hearty response. This means, of course, added work and co-operation of parents, school officers, teachers, and pupils, but it is a wonderfully comforting thought to leave large groups of children with the menace of diphtheria permanently swept aside.

But we have today a sleeping giant, one that will awake in his might and swing his lusty death dealing sword as in the days of old in the event that we cannot awake the public interest in the

*Read at the Annual Conference of the North Dakota Health Officers Association, May 3, 1933, at Bismarck, N. D.

matter of a condition which to them has become little less than an old fairy tale, and I refer to the immunization for Smallpox. It has been a period of many years since we had an outbreak of Smallpox that has made the public "Smallpox-conscious," and they seem to be somewhat callous to immunization for this disease, but it has always been an axiom that times of peace to prepare for war. It seems that it is going to require some very grave outbreak, and possibly some loss of valuable child-life to bring the importance of the oldest of our preventative measures to the popularity that it deserves. It has been unfortunate that many of our parents have been circularized with a particular vicious pamphlet of the horrors and wickedness of vaccination, and it will require much patience for us to overcome the lying propaganda that the wakeful enemy has chosen to show in his resentment towards our constructive work at this time. Our immunization for Smallpox have in some communities dropped to almost nothing, and in some of our schools the lower three or four grades have few if any pupils that have had this done for them.

It has been disappointing to me during the past few years to note the surprising amount of dental caries that is encountered in our yearly inspection of our pupils. I am sure that the daily attendance records of hundreds of pupils is influenced by this one thing alone, for a child with a simple toothache is not a good student, and the periodontal infections that are found lead me to believe that many of our sick children would be returned more promptly to their work, should the parents take more active interest in the simple matter of the children's dental health.

Our newer teaching as regards the etiology of dental caries would lead us to believe that the simple fruits and fresh vegetables that the children demand for the growth of good teeth and bone are being side-tracked for other things, because of the carelessness or the lack of knowledge of the parent, or a matter of grim economy that prevents the growing child receiving these foods at the time of his greatest need. The simplest farm has the fresh vegetables and leafy plants which, properly prepared, will grow healthy bodies. It is a matter of education even to the farm mothers that should be a part of our educational system, and it should be a matter of personal duty of every public health nurse when the under-nourished child is found, to inquire and instruct the mother in the proper management of this child, and call attention to all cases of dental malnutrition and other stigmas that arise from improper feeding and housing.

Some of our more grave systemic conditions are assuming alarming proportions. Juvenile tuberculosis is gaining on us and we will soon again be called upon to contact frequently the ravages of the white plague. It is necessary that we be ever watchful, to quickly detect and take precautionary measures that this condition demands. The public does not take with indifference the treatment of this condition and are intensely interested, which is a helpful sign. It shows that our teachings as regards prophylaxis and treatment is bearing fruit. But I have found that the pendulum has in some instances swung to the other extreme, and that the unfortunate tubercular patient has been treated as a social outcast. The public should be told that the invectives thrown at these people should be tempered with kindness, and their attitude toward the tubercular patient more of charity and less of vindictiveness, but even so our attention and suspicion must always be centered on the poor undernourished child that does poorly in school, always tired, runs the afternoon temperature, and not wait until the child is frankly tubercular and a living culture medium of the tubercle bacilli, disseminating the organism throughout the schoolroom, and endangering the lives of all the inmates. In the April number of the JOURNAL LANCET a member of our own organization, Dr. J. O. Arnson, makes this statement, "An open case of tuberculosis whose victim, unlightened, and consequently careless as to the infection he spreads in his family and community, is more of a menace to its citizens than is a murderer at large enjoying liberty of action."

The major diseases, especially the acute exanthemata, are more readily detected in the schoolroom than in the home, and the watchful teacher can promptly notice the child, detect the symptoms, even take the temperature, and dismiss the child. When at home the busy parent will overlook the early onset of disease in press of caring for the home.

Every schoolroom should be equipped with a clinical thermometer and the teacher taught how to use it, for but few of the acute contagious diseases come on without some rise of temperature, and early detection of this rise safeguards the whole school population, the suspicious child sent promptly to his home and the physician called. It may be that we will have a few false alarms, but the system in the main is to be commended.

Juvenile diabetes is encountered with greater frequency than ever before, possibly due to the fact that it is being recognized more readily

than heretofore. And the child that without apparent reason seems to be losing ground should seek the counsel of the family physician early, and the results are gratifying in most instances. Authorities, of course, differ as to the exact etiology, but it seems to be that the concensus of opinion leans toward its being one of the major conditions that accompany carelessly administered and poorly balanced food, and surely the parent of a diabetic child needs most exacting information as to the proper conduct of the child's diet in order to keep it comfortable and actually prolong its life. The use of insulin can be taught readily to the intelligent mother and the chemistry of this condition can be put into this mother's hand in many instances, when under the close supervision of the family physician. We have a number of these children in our district that are handled in this manner. It sometimes becomes a major problem to finance the child taking daily insulin, but our authorities are most generous in instances of this kind.

The secondary anemias are found commonly, and little pallid faces, pinched cheeks and decreased weights are the aftermath of influenza, tonsilitis, and often the more grave conditions. The parents are only too prone to return these children to school too soon with the idea that they will overcome the conditions without help; but this is a mistake. These children need all the help available to build up the resistance that disease has torn down.

Long hours of quiet sleep, undisturbed by radio or other extraneous noises, nutritious and wholesome food regularly partaken of, buffered with the hematinics that contribute to the prompt return of the depleted hemoglobin, are an absolute necessity to these children. It is well also to suggest in passing the secondary anemias and chlorosis found in the girls of High School age that need the special attention of the physician, and are often called to the attention of the parent only by the school nurse. It is a pleasure to note that our High School girls are now returning to more sensible customs of dress, and the blue, chilled underclothed bodies of a few years ago are not so commonly seen. I feel sure that much of the undernourishment of a few years ago was due largely to underclothed bodies, and the custom that prevailed in shaping their youth to the so-called "willowy form." This, today, seems to be tempered with more common sense, and the children lean more to the development of firm muscles, and athletic build, and are showing the improvement in more healthful and more enjoyable glowing rotundity,

with increased resistance. Tonsilitis is, and always has been a disease of great frequency, and more morbidity among school children of all ages. It continues to be one of the major causes of school absences, and the one of which we have most frequent inquiry. The tonsilitis is in itself a somewhat serious condition, and the frequent sequeala that follow are often grave, endangering life.

Where there seems to be frequent and severe attacks of this disease, or where the tonsils are chronically enlarged and the crypts filled with the residue of many infections, reference to the surgeon should be suggested and his decision final. It is to be regretted that many of the children thus referred are not taken care of, and we have instances where the same children are seen from year to year, with the same condition existing, to be found later with the high arch of the roof of the mouth, the receding jaw, and the prolapsed lower lip and jaw permanently malformed, with often some impairment of hearing, and with chronically enlarged cervical glands of the neck. These children are especially fertile ground for all kinds of infection, and it is to be urged upon parents the necessity, even at some sacrifice to themselves, to follow closely the recommendations of the attending physician.

Skin diseases, like the poor, we seem to have always with us. Scabies and the disfiguring impetigo are almost a daily problem. However, the skin diseases, especially the repulsive external lesions will bring alarm to the parent more quickly than many other conditions, and with modern therapy are quickly dispensed with, but in every school we find children where the home life is not ideal, and the customs as regards to cleanliness of the skin are not exacting; the clothing is not clean and these children become a source of infection to a whole school, and it sometimes requires stern measures and a large fund of tact in sorting out and cleaning up the children that are chronic carriers of these diseases. Co-operative work between the nurse, the pupil, the parents and the physician is the only successful method of eliminating these unfortunates. The hearty co-operation of the local physician can be secured with ease, and it is the triumverate of physician, teacher and school nurse that can accomplish the work, and keep to a minimum the ravages of contagion, and less debilitating conditions. It is for us to early detect, before the physician is called, and the complications and sequeala arising are for the physician and not the school authorities, for after the

detection the child is required to remain at home and be under medical care.

There is another matter of mental hygiene of which I am forced to speak, and I do so frankly, for it has been noted that our High School children, and more especially our girls, have been in the habit of recent years of reading most unwholesome literature. I find that in many homes this is not frowned on but rather encouraged, and the public magazine booths are crammed with wicked, vicious and lewd pictures and literature, thinly veiled in such suggestive titles as "Truth," "True Stories," etc., and are fertile fields for the teaching of filthy and degrading truths. It is refreshing that the States Attorney of our own county has had the courage to attack this vice, for he feels that unclean thoughts cannot exist in a clean body, and it is not upbuilding to flaunt before children of teen age filthy thoughts and pictures that will be foundation stones on which to build the temple of the body. I believe that where we can, it is highly necessary to help the growing girl and boy in selection of clean literature, and to lend our support to all legislation for the suppression of this evil and unnecessary blot, and I do not believe that it is outside our duties as public health nurses to include some special attention to this evil where we find it prevalent.

In this same connection I find that the radio, one of our modern blessings, has some very outspoken faults. The little skits at the children's hour just before the evening meal have developed from innocent fairy stories to wild stories of hair raising adventure, in which little children are at mercy of awful brigands, thieves and robbers, and worse, and the child is kept at a fever pitch from day to day wondering whether Orphan Annie or Skippie or other favorites will escape from the clutches that he has fallen into. The evening meal is thus disturbed, the sleep is troubled, for these little minds take these things very seriously, and there is always a restless one or two hours every night, followed each day by more anxiety as their boy or girl friends are still in their plights that they never seem to be getting out of. There is no question that this is upsetting to very many little school minds,

and is reflected in the nervous system of the children of less stable type. The radio world is very sensitive to the matter of what goes out to the public over the air, and a concerted action on the part of the great radio audience will do away with this artificial stimulus that can bring nothing but harm.

It is a difficult matter to cover the whole field of nursing activities in the few minutes allotted to me, and I have only tried to touch on the highlights in the more important phases of our work as servants of the Public Health Department of our great State, and if I have neglected some and stressed others it is an error of omission and not of commission.

Ours is a tremendous task, for we are the connecting link that binds the ailing child and the medium of alleviation that modern customs have taught us are a necessary unit and a part of an American child's birthright. Even when we have to overcome the prejudices of uninformed parents, it becomes a part of our educational system, and the most successful Public Health Nurse is the one well informed herself, most patient with the foibles and the suspicion of the public, and the most tactful in overcoming the public's lack of knowledge as regards the well known principle of sanitation, isolation, and personal cleanliness in habits of living.

Our responsibility is not to be taken lightly, for simple trusting children's lives are in our keeping, and who of us can tell how the future makers of America will look back on the care devoted to the health of their childhood days, and point with pride to our ceaseless diligence or silently chide us for the lack of interest in their well-being, when their need was so vital.

It is my hope that our future generation will, with the greater knowledge that will come to them, be imbued with the idea that we used what information we had to the limit, and point with pride to the wrongs that we corrected, and the errors that we made good and feel that we started them with clean wholesome bodies to take up the fight against the world without physical or mental handicap, and that will be reward enough. Nothing else counts.



Roentgenologic Diagnosis of Some of the Less Commonly Recognized Lesions of the Digestive Tract*

B. R. Kirklin, M.D.†
Rochester, Minn.

WHEN roentgenologic evidence of a lesion is found in the course of a routine examination of the digestive tract, it is incumbent on the examiner to think first of those diseases which are most often encountered and to orient his interpretation accordingly. It is altogether proper that the manifestations and diagnosis of such disease should receive major attention in practice, discussion and print, for a thorough knowledge of their characteristics is indispensable. Yet the rare affections cannot safely be ignored or passed over lightly, for although their individual incidence is low the aggregate ratio is considerable, their identification is often highly important, and practically all of them have bearing on the differential diagnosis of the common diseases. Hence the rare lesions should be kept constantly in mind and habitually considered in their appropriate relation to every diagnosis. Many of them have roentgenologic characteristics which can be readily elicited and are virtually pathognomonic. This is especially true of the lesions I shall consider here. As the lesions are diverse in character and situation, this review will necessarily lack continuity, but I trust that it will be sufficiently interesting to stimulate further investigation.

ESOPHAGEAL VARICES

Among esophageal affections likely to be overlooked or diagnosed wrongly are the varices which are sometimes incident to hepatic cirrhosis, splenomegaly, or other conditions, and, although such varices are not uncommon, few roentgenologic observations have been reported. In most cases the portal circulation is obstructed and the varicosities affect the lower half of the esophagus but vary in extent and degree. When they are pronounced and extensive, as in several cases observed at The Mayo Clinic, the roentgenologic picture is striking. As the first swallows of barium are taken, the affected segment of the esophagus appears as a narrow tortuous canal with marginal defects suggestive of carcinoma. But soon the mixture fills the crevices between the

varicosities and shows the esophageal lumen to be of normal or even greater than normal width. Within the shadow are numerous central and marginal defects resembling those produced by particles of food in cases of low esophageal obstruction. However, passage of the barium into the stomach is not delayed, and the defects, which are regularly rounded, are obviously produced by masses of tissue. So similar are they to intestinal or gastric polyps that the examiner may be inclined to a diagnosis of polyposis, but, although single polypoid growths are sometimes encountered, the occurrence of esophageal polyadenomas is doubtful. In short, the roentgenologic appearance of varices is virtually pathognomonic. If necessary, confirmation can be obtained by esophagoscopy, which should be employed cautiously to avoid inducing hemorrhage.

CARCINOMA OF THE CARDIA

Small lesions of the cardiac portion of the stomach, above the level of the esophageal opening, are exceedingly hard to discover. It is to be remembered that normally the dome enclosing the gas bubble is regularly rounded, symmetric, usually larger in its transverse diameter than the stomach below, and uniformly clear. If the dome is narrowed or symmetric, or shows the slightest irregularity, or if hazy shadows appear in the gas bubble, the presence of a lesion should be suspected. Most common among affections of this region are carcinoma and diaphragmatic hernia. By pressing the barium content of the stomach upward, or by examination in the Trendelenburg or prone posture, the sacculation representing a small hernia or the defect depicting an early carcinoma may be revealed. However, the barium may overshadow the latter, but if a persisting irregularity of the dome, even though slight, has been noted in the ordinary views, a diagnosis of carcinoma is usually warranted. For verification, examination with the gastroscope or esophagoscope may be requisite. In a few cases thus confirmed at the clinic, the deformity of the cardia seen at roentgenologic examination was so trivial that the tentative diagnosis of carcinoma had to be offered guardedly.

*Read before the South Dakota State Medical Association, Huron, S. D., May 16, 1933.

†Section on Roentgenology, The Mayo Clinic, Rochester, Minn.

SMALL ULCERATING CARCINOMAS OF THE STOMACH

Small ulcerating carcinomas of the stomach can easily be mistaken for benign ulcers. They differ, however, from simple ulcers in certain features which are demonstrable roentgenoscopically if the examination is appropriate and thorough. First, although tumefaction about the ulcer may be slight, it is nevertheless sufficient to produce an elevated, sometimes overhanging border. Second, the crater usually does not penetrate into the gastric wall and hence does not project beyond the normal confines of the gastric lumen. Third, the rugae in the vicinity of the niche are neither accentuated nor convergent, as in simple ulcer, but most often faintly marked or completely effaced. Fourth, spastic phenomena, such as antral spasm, incisura and spastic retention, are usually absent. Fifth, the lesion is not tender to localized pressure. Several years ago Carman noted that the barium filled crater of a small ulcerating carcinoma of the lesser curvature appeared under pressure as a concavo-convex shadow, and he applied to it the term "meniscus." But even more significant than the shape of the crater is the elevated border. If the lesion is on the posterior wall, the encircling ridge is seen under pressure as a transradiant halo; if on the lesser curvature the ridge can be approximated so as to separate the barium in the crater from that in the stomach. In every surgical case with this syndrome, including the attendant phenomena mentioned, an ulcerating carcinoma has been found at operation. In some instances the lesion was only one or two cm. in diameter and after excision presented no macroscopic evidence of malignancy, yet a confident roentgenologic diagnosis had been made before operation.

HYPERTROPHY OF THE PYLORIC MUSCLE OF ADULTS

Lesions at the pylorus are seldom difficult to discern, but it is exceedingly difficult to distinguish them from one another. Among adults early carcinoma, simple ulcer, syphilis and hypertrophy of the pyloric muscle are the most common affections of the gastric outlet, and all give rise to such similar manifestations that specific roentgenologic identification of any of these diseases is often not attempted. During the last year, however, I have noted certain signs of pyloric hypertrophy which seem to be almost pathognomonic. Most obvious among its manifestations is elongation of the pyloric canal, which attains a length of from two to four cm. When the lengthening is marked, the canal curves upward toward the duodenal bulb. Often the

axis of the canal is eccentric in relation to the antrum and lies nearer to the lesser curvature than to the greater curvature. Its antral end is like a funnel with straight or convexly curving sides. Hyperperistalsis, obstruction with retention of the motor meal, and dilatation of the stomach are common in the numerous cases associated with duodenal or gastric ulcer, but rare in uncomplicated cases among adults. A definite mass corresponding to the pyloric deformity cannot be felt, but if patients are thin the stiffening of the pyloric segment may be appreciable. The signs thus far enumerated are not distinctive for they occur also with the other common lesions at the pylorus. But last year in several cases of pyloric hypertrophy I noted a concave indentation of the bulbar base which gave to the bulb the form of a mushroom. In addition, on the lower margin of the long, curving canal, near its midpoint, a narrow crevice or a wider depression, probably representing a transverse fold of mucosa, was rather constantly present. Films of a large series of proved cases seen in previous years were then reviewed, and the mushrooming of the bulb was apparent in most of the cases in which the region was adequately depicted. The crevice on the floor of the canal was also present in several of the cases. It was learned also that pathologists have noted partial invagination of the thickened pyloric muscle into the base of the duodenal bulb, and this accounts for the basal deformity. Accordingly, I have tentatively taken this mushrooming of the bulb together with the slit-like depression in the canal as differential criteria of pyloric hypertrophy, and thus far the diagnosis has never failed to be confirmed at operation.

DUODENITIS

Several years ago Judd directed attention to a localized or diffuse inflammation of the duodenal mucosa, occurring independently of duodenal ulcer, which he designated duodenitis. In this affection the serosal surface of the duodenal wall may be blanched by a deposit of connective tissue or appear hyperemic and stippled, but the wall is not indurated as in cases of ulcer. On opening the duodenum the mucosa is seen to be reddened and edematous but not definitely ulcerated, although in rare instances minute and superficial erosions are present. Microscopically, the histologic changes characteristic of an inflammatory process are found. Clinically, the disease does not present salient points of distinction from frank ulcer of the duodenum. Investigation of an extensive series of cases at the clinic has disclosed certain roentgenologic marks by which duodenitis usually can be identified. Its funda-

mental characteristic is extreme irritability of the bulb, which tends to empty so rapidly that scarcely sufficient opportunity is given for satisfactory inspection. During the time the bulb is visualized it appears to be greatly deformed and contracted, margins of the shadow are feathery and indistinct, and often the entire duodenum is represented only by mere scattered wisps of barium. Not only is the deformity more extreme than in most cases of ulcer, but it is also unstable and its conformation changes quickly and markedly. Exceptionally, for a brief moment the bulb may fill out and show a normal contour. Duodenitis may occur in association with well defined crater ulcers, and in that event a marginal or central niche will be demonstrable, but in uncomplicated cases the niche is absent. Since organic obstruction does not exist in such cases, a residue from the six-hour meal rarely is noted. Usually the stomach is hypertonic and manifests active peristalsis. The manifestations of uncomplicated duodenitis are similar to those of reflex bulbar spasm aroused by cholecystitis or other extra-duodenal disease, but the signs are so much more pronounced that the distinction is usually feasible.

POLYPOSIS OF THE LARGE BOWEL

The chief organic diseases of the large bowel, namely, carcinoma, tuberculosis, diverticulosis and chronic ulcerative colitis, when fairly advanced or extensive, can usually be disclosed by the standard roentgenoscopic and roentgenographic examination with the barium enema. Early and localized lesions, polyposis and small polyps of any variety are less amenable to this mode of demonstration because they are so small that they fail to produce visible defects in the shadow of the barium filled bowel or are concealed by overlying loops of intestine. In 1923 their discovery was facilitated by Fischer when he introduced the method of evacuating the enema, which leaves a thin coat of barium on the mucosa, and then inflating the bowel with air. Later, the method was elaborated by Weber, who devised certain technical modifications and added to it stereoroentgenography. By this procedure the mucosal relief is depicted in minute detail, and small ulcerations, granulations and polypoid excrescences are shown clearly. Despite the barium coating, the bowel remains semi-transparent, and underlying loops can be inspected satisfactorily. Thus the double contrast method assists materially in the differential diagnosis of the various diseases, and is especially useful for the discovery of polyposis and the revelation of its exact extent.

NEOPLASM OF THE GALLBLADDER

Within the last year we have learned at the clinic that it is possible to discover and identify papillomas and adenomas of the gallbladder, provided the function of the organ is maintained sufficiently to produce a shadow of the dye, and provided the neoplasms are not associated with gallstones. Under these conditions papillomas appear as clear, oval or round, marginal or central defects, usually less than 0.5 cm. in diameter, and seldom, if ever, situated at the fundus, but often remote from it. Although papillomas are more often multiple, only one or two, or perhaps three, defects are visible ordinarily. As a rule, the shadow of the gallbladder is of good density, often above the average. Further and especially important features of papillomas are: (1) the defects preserve the same relative situation on all cholecystograms, even at re-examination; (2) when multiple, the defects are well separated, never closely grouped, and (3) as the growths are small, the defects representing them are seen best at the twentieth hour (oral method) when the gallbladder is contracted after the fatty meal, and in many cases are visible only at this time. They must be distinguished from the rarefactions caused by gas in overlying bowel and from those produced by cholesterol stones. The former tend to shift about or disappear. Gallstones change in situation, bunch together as the gallbladder contracts and often accumulate at the fundus.

Adenomas contrast strongly with papillomas in many respects. They are almost invariably single, attain a diameter of 1 or 2 cm. or even more, and are prone to have their seat immediately at the fundus. In a considerable proportion of cases adenomas are associated with cholelithiasis or chronic cholecystitis, which may prevent their revelation or diagnosis by cholecystography, but in the absence of complications they can be distinguished. Like papillomas, the adenomas produce transradiant defects which maintain the same relative position on all films and are most readily seen at the twentieth hour when the gallbladder is contracted. The defect representing an adenoma is clear and round, or, if the growth is broadly sessile and the view is tangential to its base, the transradiant area is hemispherical. Occasionally, only the apical portion of the tumor is depicted and the defect is crescentic.

There are also many other rare affections of the digestive tract concerning which little is known from the roentgenologic standpoint. We are prone to think loosely that roentgenology of

the alimentary canal is a finished chapter. It is true that there are fewer opportunities for spectacular discovery than in earlier days. But there is still room for definite improvement by more thoughtful and thorough consideration of existing data, by intensive study of unusual cases, and by modification of old methods or invention of new ones. So if this presentation stimulates you to a keener interest in these and allied subjects, it will be pleasing to me and perhaps profitable to all workers in this field.

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CONCERNING NEW DEVELOPMENTS
IN TUBERCULOSIS CONTROL

(Continued from Page 493)

sands of vaccinated children have given proof one way or another to the contentions.

Tuberculosis among nurses has been a live subject and has stimulated us to gain a better understanding of the prevalence of infection and disease in this class of workers. It has caused us to institute more precautionary measures designed to protect the nurse from needless exposure to the tubercle bacillus.

A revival of interest has been shown in the subject of tuberculosis and pregnancy. The work of Jennings, Mariette and Litzenberg must be cited here. In a study of a large number of cases, they found that pregnancy in a tuberculous woman did not constitute the vicious circle that

had been previously taught us. The old teaching was that pregnancy up to three months in a tuberculous woman should always be terminated. It was one of those "Dyed in the wool" rules of medicine that die hard. But here comes a thorough study of 470 cases that takes exception to it.¹¹ They conclude that "pregnancy does not have a marked effect on the progress of tuberculosis." And that "the study does not support the theory that pregnancy should be terminated prematurely in the tuberculous woman. The factor of treatment has been the thing largely responsible for the results."¹² And so we find that therapeutic abortions in tuberculous women are not as justified as they once were, providing that proper treatment is instituted.

There are naturally many more advances in the field of tuberculosis that should be considered. But in keeping with the old proverb of Hippocrates that "life is short, the art is long, experience fallacious, and judgment difficult," I feel duly constrained to close at this late hour.

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THE MONTANA STATE MEETING AND CANCER

We have been very much impressed by the earnestness of the Montana State Medical Society in its program of cancer prevention. During the past three years especially, there has been a very active committee at work embracing representative from the more active county societies and their report at the last meeting would indicate that great progress had been made.

The annual meeting was a success in every way but the impression still remains that the most worth while activity of the year was the attention given to this cancer problem. The society has not been satisfied with an annual discussion but has arranged for and conducted cancer clinics and demonstrations in the larger cities of the state at different and convenient times during the year.

As a rule, every locality has trained surgeons and the larger cities have microscopic pathologists but in the majority of cases, the early or precancer stages are first seen by the general practitioner. When his attention is called to any new sensation or change in function, to any new or changing local spot in any part of the body, where it can be seen or felt or when he finds an erosion of the cervix uteri, he should be aware of its possible significance and danger. So again, "small sores and poor parents one should not despise."

ENCEPHALITIS LETHARGICA

The attention of the medical world has been focused on St. Louis during the past few weeks because of its reported epidemic of sleeping sickness. So far, the information has come to us chiefly through the daily press, and that has dealt with generalities only, giving numbers afflicted and dead from time to time.

Physicians are eager to learn if and how the symptoms of this, may differ from those of any previous outbreak, so that they may be on the *qui vive* for any extension beyond its present territory. In the past, it has frequently occurred with influenza and been characterized by drowsiness, apathy, muscular weakness, and paralysis of the third cranial nerve.

Comparatively little is known of its etiology, but that little must be utilized. We know that it is an infection and therefore must, in the nature of things, be transmissible from one to another. All infectious avenues of entry into the body must be guarded, and particularly those in the proximity of the brain. Every "little cold" must be treated with due regard for its potentiality. Put them to bed and remember that "small sores and poor parents one should not despise."

THE LEADBEATER PHARMACY

It is interesting to learn that the American Pharmaceutical Association has purchased the

stock of the Leadbeater apothecary shop, in Alexandria, Va., including tinctures, simples, roots, herbs and all other appurtenancies, for the purpose of keeping them in tact and preserving the whole as an historical museum.

Those who have motored, up hill and down dale, through the picturesque and historic old dominion state, must have been struck by the uniqueness of this little city, on their way to or from Mount Vernon. Time was necessary to see the place; haste deprives one of that delicious but necessarily lazy art of contemplation that historic ground lends itself to. Here it was that GEORGE WASHINGTON used to trade, and a record book in the Leadbeater pharmacy holds an order of MARTHA WASHINGTON for a quart of castor oil. It was not far from here that WASHINGTON took the chilling horse back ride which preceded his last illness. Dr. Craik, the family physician, doubtless replenished his saddle bags from this very shop. Quaint and interesting; much to admire and marvel at because everything in those days had to be done by hand. Infusions, tinctures, extracts and pills were made upon the premises and the simple implements are now to be kept in tact for the students of evolutionary history.

SEX INSTRUCTION AND THE FAMILY PHYSICIAN

Parents and teachers neither as groups nor as individuals agree on the matter of sex education among the young. Some parents see no need for such instruction, while others believe it to be a duty to the child, but shrink from imparting it themselves. The latter group is not entirely in accord with the idea of the public schools supplying this instruction and so it is neglected.

Neglected do they think? Well not exactly. They are simply leaving it to time and chance. Curiosity will be satisfied and questions will be answered by some one, sooner or later.

Whatever difference of opinion may exist as to how and by whom such knowledge should be imparted, there is one thing upon which all will agree—it should be furnished only by those who know more about the subject than the child itself does. When parents hesitate for reasons of delicacy or otherwise to assume this responsibility they should send the child to the family physician. Every boy and every girl should be so directed before the advent of puberty.

The story may well begin with the pollenization of flowers, then the fertilization of fish eggs and

then the more immediate fertilization before extrusion of the egg as in the case of birds and higher animals. A wholesome respect for motherhood will be instilled by a straight forward presentation of the subject, and an invitation should always be extended for a further discussion in case any perplexing or unexplained problem should come to the mind for solution at some later date.

A. E. H.

SOCIETIES

INTERNATIONAL ASSEMBLY OF THE INTER-STATE POST-GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

Cleveland, Ohio

October 16, 17, 18, 19, and 20,
1933

PROGRAM

MONDAY, OCTOBER 16

8:00 A. M.

Diagnostic Clinic: "Gastric and Duodenal Ulcer."

Dr. Waltman Walters, Rochester, Minn.

Diagnostic Clinic: "Jaundice."

Dr. Harlow Brooks, New York, N. Y.

Diagnostic Clinic: "Vesical Calculi."

Dr. Hugh H. Young, Baltimore, Md.

INTERMISSION FOR REVIEW OF EXHIBITS

Diagnostic Clinic: (Subject to be announced)

Dr. Charles H. Frazier, John Rhea Barton, Philadelphia, Pa.

Diagnostic Clinic: "Colitis."

Dr. James H. Means, Jackson, Boston, Mass.

Diagnostic Clinic: "Extra-Abdominal Conditions Simulating Intra Abdominal Lesions."

Dr. John M. T. Finney, Baltimore, Md.

NOON INTERMISSION

1:00 P. M.

Diagnostic Clinic: "Rickets."

Dr. Alan Brown, Professor, Diseases of Children, Toronto, Canada.

Address: "Acute Rheumatic Fever."

Dr. Harlow Brooks, New York, N. Y.

Address: "Cancer of the Stomach."

Dr. Waltman Walters, Rochester, Minn.

Address: "Malignant Tumors of the Bladder."

Dr. Hugh H. Young, Baltimore, Md.

INTERMISSION FOR REVIEW OF EXHIBITS

Address: "Blood Dyscrasias Including the Schilling Count with Special Reference to the Specialties in Medicine."

Dr. William Egbert Robertson, Philadelphia, Pa.

Address: "Surgery of the Pituitary Body."

Dr. Charles H. Frazier, Philadelphia, Pa.

Address: "Relation of the Endocrine Glands to Circulatory Diseases."

Dr. James H. Means, Boston, Mass.

Address: "Hernia."

Dr. John M. T. Finney, Baltimore, Md.

DINNER INTERMISSION

7:00 P. M.

Address: "Prevention of Neonatal Mortality."

Dr. Alan Brown, Toronto, Canada.

Address: "Diagnosis of Brain Tumors."

Dr. Walter E. Dandy, Baltimore, Md.

Address: "The Choice of Anesthetic Methods."

Dr. Arthur Dean Bevan, Chicago, Ill.

Address: "The Periodic Health Examination."

Dr. Charles A. Elliott, Chicago, Illinois.

Address: "Cancer of the Colon."

Dr. Fred W. Rankin, Lexington, Ky.

TUESDAY, OCTOBER 17.

8:00 A. M.

Diagnostic Clinic: "Diseases of the Gall-Bladder."

Dr. E. Starr Judd, Rochester, Minn.

Diagnostic Clinic: "Cirrhosis of the Liver."

Dr. Cyrus C. Sturgis, Ann Arbor, Mich.

Diagnostic Clinic: "Menorrhagia and Metrorrhagia."

Dr. P. Brooke Bland, Philadelphia, Pa.

INTERMISSION FOR REVIEW OF EXHIBITS

Diagnostic Clinic: "Coronary Thrombosis and Angino Pectoris."

Dr. R. W. Scott, Cleveland, Ohio.

Diagnostic Clinic: "Tuberculosis of the Urinary Tract."

Dr. Hugh Cabot, Rochester, Minn.

Diagnostic Clinic: "Suppurative Diseases of the Chest."

Dr. George P. Muller, Philadelphia, Pa.

NOON INTERMISSION

1:00 P. M.

Diagnostic Clinic: "Metabolism in Pregnancy."

Dr. Otto H. Schwarz, St. Louis, Mo.

Address: "Megacolon."

Dr. E. Starr Judd, Rochester, Minn.

Address: "Differential Diagnosis and Treatment of Anemia."

Dr. Cyrus C. Sturgis, Ann Arbor, Mich.

Address: "Cancer of the Uterus."

Dr. P. Brooke Bland, Philadelphia, Pa.

INTERMISSION FOR REVIEW OF EXHIBITS

Address: "Clinical Aspects of Arteriosclerosis."

Dr. R. W. Scott, Cleveland, Ohio.

Address: "Management of Bilateral and Recurrent Ureteral and Kidney Stones."

Dr. Hugh Cabot, Rochester, Minn.

Address: "Appendicitis."

Dr. George P. Muller, Philadelphia, Pa.

Address: "Chronic Subinvolution, Its Pathology, Treatment and Prevention."

Dr. Otto H. Schwarz, St. Louis, Mo.

DINNER INTERMISSION

7:00 P. M.

Address: "Recent Advances in the Knowledge of Endocrine Diseases."

Dr. Leonard G. Rowntree, Philadelphia, Pa.

Address: "Diagnosis and Treatment of Bronchiectasis."

Dr. Arthur C. Christie, Washington, D. C.

Address: "Cancer of the Larynx."

Dr. Gordon B. New, Rochester, Minn.

Address: "The Association of Eye Changes with General Diseases."

(Speaker to be Selected).

WEDNESDAY, OCTOBER 18.

8:00 A. M.

Diagnostic Clinic: "Diseases of the Spleen—Leukemia."

Dr. Warfield T. Longcope, Baltimore, Md.

Diagnostic Clinic: "Inoperable and Recurrent Carcinoma of the Breast."

Dr. Burton J. Lee, New York, N. Y.

Diagnostic Clinic: "Medical Conditions Simulating Surgical Conditions of the Upper Abdomen."

Dr. Frederick J. Kalteyer, Philadelphia, Pa.

INTERMISSION FOR REVIEW OF EXHIBITS

Diagnostic Clinic: "Nephritis in Children."

Dr. W. McKim Marriott, St. Louis, Mo.

Diagnostic Clinic: "Gall-Stones and Cholecystitis."

Dr. Frank H. Lahey, Lahey Clinic, Boston, Mass.

Diagnostic Clinic: "Tic Douloureux."

Dr. Howard C. Naffziger, San Francisco, Calif.

NOON INTERMISSION

1:00 P. M.

Diagnostic Clinic: "Ileus."

Dr. Irvin Abell, Louisville, Ky.

Address: "Allergic Diseases."

Dr. Warfield T. Longcope, Baltimore, Md.

Address: "Drug, Neurotic and Self-Induced Eruptions" (Lantern slide Demonstration).

Dr. Frank C. Knowles, Philadelphia, Pa.

Address: "Surgical Treatment of Angina Pectoris."

Dr. Elliott C. Cutler, Moseley, Boston, Mass.

INTERMISSION FOR REVIEW OF EXHIBITS

Address: "Differential Diagnosis of Gall-Bladder Diseases from the Roentgenological Standpoint."

Dr. Bernard H. Nichols, Cleveland, Ohio.

Address: "Sweat Gland Carcinoma of the Breast."

Dr. Burton J. Lee, New York, N. Y.

Address: "The Diagnostic Value of the Respiratory Rate as a Sign in Differentiating Acute Pulmonary Disease from Acute Abdominal Disease."

Dr. Frederick J. Kalteyer, Philadelphia, Pa.

Address: "Regeneration of the Liver."

Dr. Charles H. Mayo.

DINNER INTERMISSION

7:00 P. M.

Address: "Special Points in the Feeding of Children with Special Relation to Dentition and Growth."

Dr. W. McKim Marriott, St. Louis, Mo.

Address: "Intrathoracic Goiter."

Dr. Frank H. Lahey, Boston, Mass.

Address: "The Diagnosis of Spinal Cord Tumors."

Dr. Howard C. Naffziger, San Francisco, Calif.

Address: "Preoperative and Post-operative Management in Abominal Surgery."

Dr. Irvin Abell, Louisville, Ky.

Address: "Problems of Cardiac Failure."

Dr. Joseph T. Wearn, Cleveland, Ohio.

THURSDAY, OCTOBER 19.

8:00 A. M.

Diagnostic Clinic: "Psychoses of Different Age Periods."

Dr. Louis J. Karnosh, Cleveland, Ohio.

Diagnostic Clinic: "Osteomyelitis—Ischemic Paralysis."

Dr. Dean D. Lewis, Baltimore, Md.

Diagnostic Clinic: "Knee Joint Injuries."

Dr. John J. Moorhead, New York, N. Y.

INTERMISSION FOR REVIEW OF EXHIBITS

Diagnostic Clinic: "Complications of Pregnancy."

Dr. William B. Hendry, Toronto, Canada.

Diagnostic Clinic: "Laryngitis."

Dr. Fielding O. Lewis, Philadelphia, Pa.

Diagnostic Clinic: "Differential Diagnosis Between Ulcer of the Stomach and Duodenum and Gall-Stones."

Dr. William D. Haggard, Nashville, Tenn.

NOON INTERMISSION

1:00 P. M.

Address: "The Prognosis and Treatment of the Anginal Syndrome."

Dr. Elsworth S. Smith, St. Louis, Mo.

Address: "Reconstruction Surgery."

Dr. Dean D. Lewis, Baltimore, Md.

Address: "Newer Concepts of Methods of Procedure in the Management of Infections of the Gastro-Urinary Tract."

Dr. Joseph F. McCarthy, New York, N. Y.

Address: "Treatment of Fractures."

Dr. John J. Moorhead, New York, N. Y.

INTERMISSION FOR REVIEW OF EXHIBITS

Address: "Problems of Hemorrhage in Obstetric Practice."

Dr. William B. Hendry, Toronto, Canada.

Address: "Relation of Tonsils to Systemic Infection."

Dr. Fielding O. Lewis, Philadelphia, Pa.

Address: "The Recognition of Affective Disorders and their Management."

Dr. Louis J. Karnosh, Cleveland, Ohio.

Address: "The Surgery of the Congenital and Acquired Ear Deformities."

Dr. George V. I. Brown, Milwaukee, Wis.

DINNER INTERMISSION

7:00 P. M.

Address: "Lobectomy for Chronic Non-Tuberculous Suppurative Bronchietasis."

Dr. Edward W. Archibald, Montreal, Canada.

Address: "The Diagnosis of Pulmonary Diseases."

Dr. Willis F. Manges, Philadelphia, Pa.

Address: (Subject to be Announced).

Dr. John R. Fraser, Montreal, Canada.

Address: "The Prevention of Heart Disease in Children."

Dr. Edward L. Bauer, Philadelphia, Pa.

FRIDAY, OCTOBER 20.

8:00 A. M.

Diagnostic Clinic: "Diseases of Civilization."

Dr. George Crile, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Diabetes in Children."

Dr. Elliott P. Joslin, Boston, Mass., and

Dr. Phiscilla White, Physician, New England Deaconess Hospital, Boston, Mass.

Diagnostic Clinic: "Pernicious Anemia."

Dr. Lewellys F. Barker, Baltimore, Md.

INTERMISSION FOR REVIEW OF EXHIBITS

Diagnostic Clinic: "Nephritis in Adults."

Dr. Henry A. Christian, Boston, Mass.

Diagnostic Clinic: "Carcinoma of the Large Intestine and Rectum."

Dr. John F. Erdmann, New York, N. Y.

Diagnostic Clinic: "Transplantation of the Ureters."

Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.

NOON INTERMISSION

1:00 P. M.

Address: "Surgical Management of Diseases of the Gall-Bladder and Ducts."

Dr. George Crile, Cleveland, Ohio.

Address: "Diabetes Associated with Hyperthyroidism and with Tuberculosis."

Dr. Elliott P. Joslin, Boston, Mass.

Address: (Subject to be Announced).

Dr. William J. Mayo, Chief of Staff, Mayo Clinic, Rochester, Minn.

President, Inter-State Post-graduate Medical Association.

Address: "Obesity—Its Forms and Treatment."

Dr. Lewellys F. Barker, Baltimore, Md.

Address: "Types of Edema and their Treatment."

Dr. Henry A. Christian, Boston, Mass.

Address: "Management of Acute Abdominal Conditions."

Dr. John F. Erdmann, New York, N. Y.

Address: "Gastro-Intestinal Disturbances Associated with Diseases of the Upper-Urinary Tract."

Dr. William E. Lower, Cleveland, Ohio.

List of Foreign Guests not Completed.

Evening

Assembly Dinner

Informal

SATURDAY, OCTOBER 21.

Post-Assembly Clinics in charge of the staffs of Cleveland Hospitals.

25 YEARS AGO

from JOURNAL-LANCET

The Sisters of Charity, Fargo, erected a new hospital costing \$50,000.

Dr. E. L. Cheney, of Two Harbors, has decided to locate in Duluth.

Dr. Ivan Maercklein, of Ashby, N. D., has located at Braddock, N. D.

Dr. A. Cyr, of Ghent, has returned from New York, and resumed his practice.

Dr. G. A. Stevenson, Albert Lea, Minn., has returned home from his European trip.

The physicians of Sibley county, Minn., organized a county medical society last week.

Dr. G. A. Eisengraber was appointed physician in charge at the new hospital at Waconia, Minn.

Dr. R. W. Patterson, a graduate of the Northwestern University of Chicago, has located at Eagle Bend, Minn.

Dr. C. N. Callander, Fargo, has resumed his practice after spending several months at Johns Hopkins and in Europe.

Dr. Helen Hughes has returned to Mankato after a year's absence in Europe. She will make a specialty of women's and children's diseases.

For Sale—a rubber-tired covered Stanhope which was made by Babcock and cost when new \$225, is now for sale cheap, and is in good condition. Address Dr. F., care of the Lancet.

Dr. Frank Allport, of Chicago, formerly of Minneapolis, has been elected clinical professor of ophthalmology and otology in Northwestern University, which is associated with the Chicago University.

The first meeting of the Fourth District Medical Society of S. D., was held at Huron. The following officers were elected: Dr. W. H. Lane, Miller, president; Dr. C. B. Alford, Huron, vice-president; Dr. C. J. Lowrey, Pierre, secretary; Dr. J. L. Foxton, Huron, treasurer.

The annual meeting of the Southern Minnesota Medical Association met in Winona and the following officers were elected for the coming year: Dr. C. Graham, Rochester, president; Dr. W. F. Milligan, Wabasha, first vice-president; Dr. F. W. Dimmitt, Red Wing, second vice-president; Dr. W. T. Adams, Elgin, 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. Robert Windsor, formerly of Fergus Falls, has moved his office to Rothsay, Minn.

Dr. G. M. Tangen, Canby, Minn., has been spending several weeks in Chicago doing post graduate work.

Dr. Charles Owston, Walhalla, is now located at Neche, Minn., where he will continue his general practice.

Dr. K. Olafson who was recently admitted to practice medicine in North Dakota, has opened offices at Cavalier.

Dr. Robert L. Lang, formerly in practice at Egan, S. D. has moved to Austin, Minn. and will continue his general practice.

Dr. Napoleon Salvail, who has been in active practice at Helena, Mont., since 1883, died last month at the age of 75 years.

Dr. A. Thompson, formerly located at Raymond has moved to Willmar, Minn., where he will continue in general practice.

Mrs. Mary D. Goodman, one of the pioneer nurses of Minnesota, died at her home in Pine Island, at the advance age of 91 years.

Dr. C. A. Boline, a recent graduate of the University of Minnesota, has opened offices for general practice at Battle Lake, Minn.

Dr. Newton W. Fawcett, Starkweather, N. D. was married to Miss Vera G. Strong on August 26th at the residence of the brides parents in that city.

Grand Meadow, Minn., has a new physician who has located there for the practice of medicine. Dr. F. A. Rosenthal, formerly of Iroquois, S. D. is the doctor.

Dr. M. W. Quigley, an associate professor of medicine at the University of Pennsylvania, has located at Caledonia, Minn., and opened offices for general practice.

Miss Myrtle Heide, R.N. and Miss Martha Sather, R.N., have opened a new hospital at

Bowman, N. D. The hospital will be furnished with a complete new outfit.

Dr. Wm. C. Bernstein, New Richland, Minn., was recently married to Miss Mildred Goldberg of Minneapolis. Both parties are graduates of the University of Minnesota.

Another cottage will be added to the group at San Haven, N. D. Sanatorium at a cost of over \$5,000, which was donated by the Degree of Honor Protection Association.

Dr. Earl M. Haugrud a recent graduate of the North Dakota University, and the Northwestern Medical University of Chicago, has opened offices for general practice at Fargo.

Dr. Gilbert D. Todd, Litchville, N. D. passed away at the Jamestown hospital, after a few days illness at the age of 53 years. Dr. Todd was a graduate of the University of Minnesota in 1903.

A new modern hospital to cost about \$10,000 is under construction by Dr. O. F. Ringle, at Walker, Minn. The hospital will provide rooms for thirty beds, and plans are made for opening this fall.

At the last meeting of the Rosebud Medical Society held at Winner, S. D., Dr. E. W. Jones, president, and Dr. J. F. D. Cook, secretary of the State Medical Association, were present as guest speakers.

Health education will be the keynote of the year's work for the Women's Auxiliary to the Minnesota State Medical Association according to a plan formulated by Mrs. A. A. Passer, Olivia, state president.

Dr. John O. Taft, a prominent physician of Minneapolis for many years, died very suddenly on August 29th of heart trouble. Dr. Taft was 53 years of age, and had always taken an active interest in all medical societies.

Dr. B. C. Bernard of Thief River Falls was elected president of the Minnesota State Sanatorium Association at the annual meeting of the group held at Sand Beach last month. Dr. L. H. Flancher of Sand Beach is the retiring head.

Dr. and Mrs. A. Stolinsky have returned to their home at Sheldon, N. D. after a 14-month tour of Europe during which the doctor studied in clinics of Vienna. Dr. Stolinsky also did advanced work in clinics of Switzerland and England.

The Wright County Medical Society held their August meeting at Annandale, Minn., bringing their wives and enjoying a fine picnic lunch. Dr. Machnider Wetherby of Minneapolis was the guest speaker, presenting a paper on "Arthritides."

Dr. Mason Allen who has been in active practice at St. Paul for the past 36 years passed away on September 1st, after being confined to his home for several months by illness. Dr. Allen was a University of Minnesota graduate in 1897.

Chances of an outbreak of sleeping sickness in Minnesota are considered slight, and it is probable the current epidemic at St. Louis will be restricted to that area, a bulletin of the Minnesota State Medical Association has recently announced.

A recent survey of nursing schools throughout the entire country shows South Dakota's 19 hospital training schools ranking well with the average. Statistics gathered in 1929 and again in 1932 show "surprising progress" during the three year period.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul. The program for September 20th—"Height, Weight and Health;" September 27th—"Patient and Doctor."

After searching for many years for hay fever relief, Dr. D. M. Nigro, Kansas City physician, has found Duluth as the ideal spot in America. He visited the Pacific coast, the mountains in Colorado and resorts in the East, but there is nothing like the Lake Superior breezes for hay fever sufferers, he said. "I found instant relief in Duluth and in a few hours no longer was suffering from hay fever."

The Northwest District Medical Association held its monthly meeting at Minot on September 1st, the meeting being in the form of a gettogether. A dinner prepared by Dr. F. E. Wheelon was served. There were 35 doctors present, including six from out of town. Dr. A. R. Sorenson, Minot, is president; Dr. F. K. Kolb, Granville, vice-president and Dr. J. R. Pence, Minot, secretary. Henry Kermott, son of Dr. L. H. Kermott and Don McCannel, son of Dr. A. D. McCannel, both medical students, were guests at the meeting.

CLASSIFIED ADVERTISEMENTS

POSITION WANTED

Position, locum tenens, or location, wanted by experienced physician. Address Box 809, care of this office.

FOR SALE

South Dakota, good practice, large territory. For price of equipment. Will sell installment plan to right party. Address Box 806, care of this office.

PHYSICIAN WANTED

A Physician interested in locating in a promising small town get in touch with Mrs. Jennie Stoddard, Alma Center, Wisconsin. (A house and office available.)

POSITION WANTED

Graduate, registered nurse with clinical laboratory experience and Business College training in Bookkeeping, Shorthand, and Typing, wishes position in doctor's office or with clinic. Address Box 901, care of this office.

OFFICE FOR RENT

Fine office in a good location for a doctor and a dentist. Established as such for 18 years. Will rent both together or separately. Rent very reasonable. Located over a drug store. If interested, see J. F. Danek (Druggist), Plymouth and Washington Avenues, Minneapolis.

POSITION DESIRED

As Office Nurse or Doctor's Assistant. Graduate Johns Hopkins Hospital, Baltimore, 1929. Experienced in Institutional and Private Duty; also stenographic and clerical office work. Best of references. Inquire: Ruth Houlton, Director Visiting Nurses' Association, Minneapolis. Address Bernice Kapp, R.N., 216 S. Third St., Livingston, Mont.

FOR RENT

Doctor's office occupied by prominent physicians, elegantly equipped. Individual examination rooms, separate treatment rooms, laboratory. Large and pleasing reception room, shared with dentist and other physician. Free gas and free compressed air. New, up-to-date medical building located in best residential business district. Unusual opportunity. Address Box 701, care of this office.

FOR SALE

Taken under mortgage one Victor Snook X-Ray (10 inch) complete including Fluoroscope in table, Stereoscope, Coolidge switch and control. One Kelly-Koett bucky diaphragm, stone developing tank, lead film box, film cassettes, viewing boxes, etc. Tubular overhead. Leibel Florsheim Diathermy. Benedict Roth Basal Metabolism, Gas Incubator, Analytical Scales, Burdick Radiant Lamp. Will sell 10% of original cost. Write Mr. Raleigh, 3501 Colfax Avenue South, Minneapolis, Minn.

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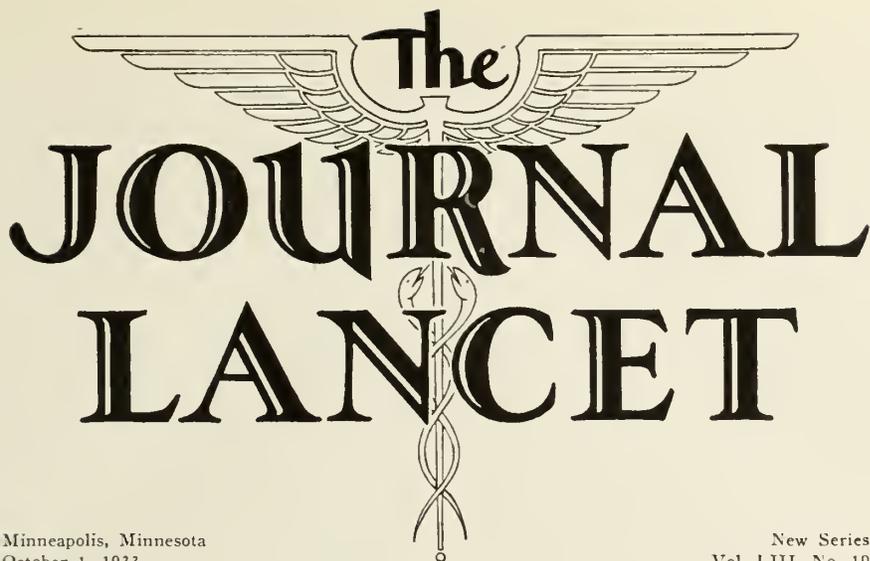
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Minneapolis, Minnesota
October 1, 1933

New Series
Vol. LIII, No. 19

Report on the Outbreak of Encephalitis in St. Louis, Missouri

F. E. Harrington, M.D.
Commissioner of Health
Minneapolis

THE city of St. Louis is situated on the eastern border of the state of Missouri, and has as its eastern boundary the Mississippi River, at a point eleven miles south of the junction of the Missouri River with the Mississippi. At this point the Mississippi River forms a slight curve with its convexity to the east. The city limits on the west begin at a point on the bank of the river, follow a curved line with its convexity to the West and ends at the river bank, a distance of about fourteen miles between the two points. On the east side of the river is East St. Louis, Illinois. The territory west of the city is St. Louis County. The western boundary of the city was established in 1874 so that an appreciable number of the population lives in the county and would be included in the city were the city limits extended to include congested residential areas. As these boundary lines exist, the city of St. Louis has a population of 820,000 people and the county has a population of 230,000 people. The greater majority of the population in the county lives within three miles of the western limits of the city of St. Louis, making a metropolitan population area of about one million people.

It is in this population distribution that encephalitis has occurred. The first case of the disease recognized and reported appeared just west of the city limits in the county, and the second case east of the city limits within the city. This

was July 24, 1933. The spread of this disease was rapid and was fairly evenly distributed throughout the population area, both city and county. There seemed to be no selection as to social state. The prevalence was in no manner markedly noticeable among the poorer classes, or in any particular section of the city or county. There was no particular selection between the sexes, but there was a marked predilection in age groups. When the epidemic had reached a proportion of 700 cases, two per cent only were in the age group below twelve years, and the prevalence increased as age groups advanced. Of the first 100 deaths reported, 90 per cent occurred among those more than 45 years of age, and 75 per cent among those over 55 years of age. Deaths in children were rare.

Encephalitis is not an unknown disease in the United States and has appeared sporadically so that its existence has not been viewed with alarm. The death rate has been reasonable high and many who have not died have never completely recovered, being left with some residual handicap. The epidemic which appeared in St. Louis does not correspond to the disease as it has been known in this country. It is still called "encephalitis" but it presents more cerebral symptoms, simulating meningitis, than does encephalitis lethargica. The St. Louis outbreak presents a disease that has been described in medical literature by the Japanese. An epidemic of this character of disease appeared in Japan in 1924. The

onset of the disease is rather sudden. The first symptoms present are intense headache, slight sore throat, a rapid rise in temperature, and prostration. With these symptoms usually will appear a slight soreness and stiffness of the muscles of the back of the neck. Occasionally there is a general tenderness over the entire body. This latter symptom is not pronounced, probably because of the overshadowing headache. Muscle stiffening in the neck, however, is rather general and characteristic. This symptom is easily elicited. If the hand is placed back of the patient's head and an attempt made to raise the head as one would in giving medicine or a drink of water, flexure of the neck does not occur but the body can be lifted, bending at the hips. Only in the more severe conditions does this approach opisthotonos.

Within twelve hours from onset the patient is usually ill, with a temperature approximating 104 to 105 degrees Fahrenheit. Some patients are nauseated. Complete prostration with lethargic symptoms, although not fully established is the rule. The patient can be roused easily but presents all the symptoms of extreme illness. These symptoms may persist for from three to ten days, and occasionally longer. During this period the patient presents a picture of what has been characterized as the "typhoid state." An examination of the patient during the height of symptoms discloses increased reflexes, complete loss of appetite, and a desire to be let alone. At times there seems to be complete loss of memory. None of the nerve tracks or routes seem to be affected beyond occasional reflex exaggeration. The cranial nerves show no derangement of function except in the occasional case where bulbar involvement appears. The blood picture shows an increased leukocytosis, usually from twelve to fifteen thousand, and occasionally higher. Spinal puncture delivers the spinal fluid under pressure with a cell count varying from thirty up to two hundred and fifty. Occasionally the count has gone higher. There seems to be no relationship existing between the severity of the attack, the symptoms present, and the cell count of the spinal fluid. This cell count is not constant and may and frequently does increase during the progress of the disease. There is frequently suppression of the urine. Most of the older patients present an appearance of dehydration. There are, as might be expected, instances of tremor and other manifestations which accompany high temperatures in disease or cerebral involvement. When death ensues the patient dies of terminal hyperstatic pneumonia. Patients who recover do so by crisis. The temperature falls

rapidly unless there are some complicating conditions not incident to encephalitis which produce a fall in temperature by lysis. Convalescence is accompanied by no apparent secondary condition. No paralysis accompanies the disease and there are no paralyses resulting therefrom. There are, of course, all degrees and grades of manifestation of encephalitis. Many patients throughout the city have come down with an acute disease condition and recovered completely in three, four and five days. Unquestionably, many hundreds of cases of encephalitis have existed without a definite diagnosis having been arrived at, and with such spontaneous recovery, without having been recorded as cases.

The postmortem findings are rather characteristic. Persons advanced in years present on post-mortem examination many chronic conditions. These must not be confused with the acute findings upon post-mortem following death from encephalitis. The disease does not last sufficiently long to produce emaciation. The only acute pathological conditions noticed upon necropsy are in the brain, kidney, and lung. There seems to be no particular meningeal involvement although the post-mortem picture shows frequently a passive congestion. There is usually a large accumulation of fluid between the pia and the cortex. This gives the brain a gross appearance of bog-giness. This fluid does not escape until the pia has been opened and when drained leaves the brain relatively normal in appearance, that is, there are no areas of cortical hemorrhage. The cerebrum seems to be the only portion of the brain affected and the pressure caused by the accumulation of fluid seldom reaches the motor areas or the base. This accounts for the absence of symptoms either in motor areas of the body or cranial nerves. The cerebellum is not edematous and the cord is rarely affected. Sections of the brain show the tissues bathed in fluid and occasionally the white matter is stained a very delicate pink. Few punctate hemorrhages or petechiae are found, but there are no gross hemorrhages in the brain either cortex or white matter. The kidneys show inflammatory changes in the pelvis but no marked change in the parenchyma. The lungs show passive congestion with quantities of exudate. This involves both the bronchi and the parenchyma. The gross picture, therefore, of the post-mortem is a wet brain and a wet lung. Authorities find a similarity between the pulmonary appearance of this type of encephalitis and the fatal cases of influenza.

Microscopically the pathological brain tissues show little change. In the kidney parenchyma

are found the inclusion bodies and in both brain and kidney tissues occasional lymphocyte collar is demonstrated. The inclusion body is usually accepted by the micropathologist as indicative of a filterable virus. This type of encephalitis has been under study by the laboratories of the City Department of Health of St. Louis, the laboratories of the Washington University of St. Louis, and by a corps of physicians detailed by the Surgeon General, United States Public Health Service. Materials obtained upon post-mortem from brain, kidney, and cerebral spinal fluid were injected intercerebrally into monkeys, guinea pigs, rabbits, white rats, dogs and sheep. This was an effort to transfer this material directly into the susceptible portions of bodies of experimental animals in order to develop, if possible, symptoms in the injected animal. The first set of experiments produced no symptoms in any laboratory animal but the monkey. Twenty-five per cent of the monkeys injected developed some symptoms. These symptoms were pronounced by the men making the study as "not inconsistent," but at the same time they were not characteristic of symptoms found in human beings. Similar material that had been used in injecting these monkeys was collected post-mortem from the three monkeys showing symptoms, and was transferred by intercerebral injection into a second series of monkeys. One-third of the second set of monkeys injected developed some indefinite symptoms. The pathologists are not prepared to state that they have actually transferred infectious material and the experiment will require unquestionable repetition before any pronouncement will be made.

Further studies were made on the possibilities of the transmission of encephalitis from the patient to monkeys by means of the mosquito. Mosquitoes, both of the *Culex* and *Anopheles* families, were used. They were fed upon patients in different periods of the disease and then after a lapse of time, corresponding somewhat to the interval in yellow fever and malaria, these mosquitoes were fed upon monkeys. The first experiments of this kind yielded no encouraging results. In the studies of transmission of malaria and yellow fever it was learned that the mosquito in drawing blood takes into its body the plasmodium or causative agent. This agent thereupon goes through a life cycle in the body of the mosquito, over a period from seven to nine days, and is found in the salivary glands from which the mosquito injects its digestive fluid into the person or animal bitten. Should encephalitis follow the course of the mosquito as a vector it might be expected that the infecting agent of enceph-

alitis would incubate in the body of the mosquito and be transmitted to the blood stream of the animal bitten at the time of the second feeding of the mosquito. To determine the possibilities of transmitting encephalitis through the bite of an infected mosquito, three of the Public Health Service officers on duty in St. Louis have volunteered to permit these infected mosquitoes to bite them.

Epidemiologically, no light has been thrown on the spread of encephalitis as either an infectious or contagious disease. There seems to be no common factor. The water supply of St. Louis has been cleared of suspicion, and even though it might have been under suspicion the St. Louis water supply does not reach all of the homes in the county where the disease exists. The milk supply is under investigation but the numerous sources distributing milk throughout the area would make it unreasonable to assume that the entire milk supply of St. Louis and St. Louis county was infected at the same time. Food factors seem to be of little consequence. Weather conditions present the only common factor. Intensive studies by house to house canvass is now under way in St. Louis to determine if possible any common factor that might be brought to light. Certainly encephalitis is not highly contagious. In the first five weeks of the outbreak in both St. Louis and St. Louis county there were only five homes in which more than one case of the disease existed. In the St. Louis Home for the Aged, with one thousand inmates of the susceptible age group, which constituted the majority of the outbreak, there were but twelve cases of this disease reported in the first four weeks of the epidemic. In the absence of a known causative agent, no specific treatment can be outlined or instituted. In many respects encephalitis as it prevails in St. Louis corresponds closely to poliomyelitis. In neither disease is the causative agent known. Dr. E. C. Rosenow in studies conducted in St. Louis claims to have isolated a streptococcus as the cause of encephalitis. The laboratories of the City Health Department, the Washington University, and the United States Public Health Service have all failed to find any agency responsible for encephalitis in St. Louis. Press reports up to September 16th, indicate a lessening in the number of the cases reported. It is felt that perhaps the epidemic is gradually subsiding.

In the absence of any known infecting agent and with the apparent epidemiological factor of

(Continued on Page 524)

A Historical Sketch of the Treatment of Wounds

Owen W. Parker, M.D.
Ely, Minn.

ON OCTOBER 16, 1896, the medical faculty of the University of Minnesota celebrated the fiftieth anniversary of the administration of ether by Dr. Morton at the Massachusetts General Hospital; Dr. J. Collins Warren, of the famous Boston family of Warrens, was the surgeon.

I had just entered the University Medical School and shall never forget the description of this dramatic and historic event by the late Dr. Burnside Foster of St. Paul, whose voice, bearing, and cultural attainments so eminently fitted him to speak of such an event. The inspiration of his address gave me an interest in historical backgrounds of medical subjects. There is much of interest and profit in the study of the history of medicine, and I feel sure that some history woven into medical teaching is of value.

The following compilation of historical facts on the subject of the treatment of wounds, I trust may be of interest and profit.

In that charming sketch by Sir William Osler, "The Evolution of Modern Medicine," he quotes Lucretius, Pliny, Celsus, and many others to show the great Antiquity of Primitive Medicine out of which has developed Modern Rational Medicine.

In it he states that medicine arose out of the primal sympathy of man with man, out of the desire to help those in sorrow, need and sickness.

"In the primal sympathy
Which having been must ever be,
In the soothing thoughts that spring
Out of human suffering."

"The instinct of self-preservation, the longing to relieve a loved one, and above all the maternal passion, for such it is, gradually softened the hard race of man.

"In the marvelous sketch of the evolution of man by Lucretius, nothing illustrates more forcibly his foresight of events than his picture of the growth of sympathy in which he says, 'When with cries and gestures they taught with broken words that 'tis right for all men to have pity on the weak.'"

Sir William continuing says, "I have heard the well-known historian, the late Dr. Payne, remark that the basis of medicine is sympathy, and the desire to help others, and whatever is done with that end must be called medicine." Dr. Finney,

writing, says, "Greek medicine is really the beginning of historical medicine. Here we find the works of Hippocrates 460 B. C. His is the greatest name in ancient medicine—a man characterized by simplicity of work and observation without speculation, and whose work has remained a model to the present time. Hippocrates typified the Grecian spirit of his day in his insistence upon explaining various phenomena observed without regard to dogma or tradition, taught his students that diseases spring from natural causes and are not the manifestations of the displeasure of the gods. That was the keynote of rational medicine struck over twenty-three centuries ago, but which had to be sounded again and again through many centuries ere his successors were brought in harmonious procession. One of the grandest achievements of science is the establishment of the principle that nature works under fixed laws. As the pioneer in the establishment of this principle, Hippocrates deserves the greatest credit."

Quackery, Charletanism, and a belief in spirits and magic have always been with the race since the earliest history of medicine. Dr. West, secretary of the A. M. A., in a discussion at one of the meetings of the State Medical Society, said that in his opinion they always would exist, until the belief in magic had disappeared from mankind. As illustrating how deeply and anciently has superstition, a belief in spirits and magic, been interwoven in the mind of man, it is interesting to note that Osler says that the ancient Egyptians believed that death and disease were not natural and inevitable, but caused by some malign influence which could use any agency, natural or invisible, and often belonging to the invisible world. Often, though it belongs to the invisible world, and only reveals itself by the malignity of its attacks, it is a god, a spirit, the soul of a dead man, that has cunningly entered a living person or that throws itself upon him with irresistible violence. Once in possession of the body, the evil influence breaks the bones, sucks out the marrow, drinks the blood, gnaws the intestines and the heart, and devours the flesh. The invalid perishes according to the progress of the destructive work, and death speedily ensues, unless the evil spirit or genius can be driven out of it before it has committed irreparable damage.

Whoever treats a sick person has, therefore, two equally important duties to perform. He must first discover the nature of the Spirit in possession, and if necessary its name, and then attack it, drive it out or even destroy it. He can only succeed by powerful magic, so he must be an expert in reciting incantations, and skillful in making amulets. An amulet is an ornament, gem, or scroll, or a package containing a relic worn as a charm or preservative against evils or mischief, such as diseases and witch-craft, and often inscribed with a spell or magic incantation. We see the persistence of this ancient belief, even in modern times, in the wearing of a ring on the finger, charms hung around the neck, a buckeye carried in the pocket to keep away disease. "He must use medicine to contend with the disorders which the presence of the strange being has produced in the body. In this way it came about that diseases were believed to be due to hostile spirits, or caused by the anger of a god, so that medicines, no matter how powerful, could only be expected to assuage the pain; but magic alone could remove the disease."

The medical beliefs of the Indians of North and South America at the time of the discovery by Columbus according to Dr. Ales Hrdlicka were about on a par with those of other human groups in similar stages of culture, including the majority of white people in the pre-Christian era. "They were largely supernatural, partly natural or empirical. Wounds and disorders the cause of which was plain, were regarded quite rationally and treated in the same manner. In every tribe the older women and men knew scores of herbs and various mechanical or other means, which they employed exactly as did many of our country grandmothers and grandfathers, simply, rationally, and often with marked success. They knew poisons, emetics, cathartics, antifebriles, tonics, narcotics, hemostatics, cleansing solutions, healing gums and powders. They had antidotes. They employed massage, pressure, scarification, cauterization, bandaging, splints, sucking, enemas, cutting, scraping, suturing. But whenever the cause of a complaint was obscure, or when the complaint was proving dangerous and all ordinary aid had failed, particularly if this was in a hitherto healthy adult—then their minds turned to the supernatural. The disease was then conceived as either an affliction caused by an offended or malevolent spirit or deity, as the revengeful act of a secret enemy, or as the magic of a sorcerer. The pains and other manifestations of the disease that were not understood

were then believed to be due to some noxious material or magic object that had secretly been "shot" into the patient, and the cure could be effected only by the extraction of this object, the propitiation or driving away of the responsible spirit, appeal to the totem of the patient or his group, or the neutralization and confusion of the guilty sorcerer through a stronger "medicine."

Man has never lost his belief in the efficacy of magic in the widest sense of the term. Only a very few of the most intellectual nations have escaped from its shackles. Miracles in medicine are still expected, and looked for like the pot of gold at the end of the rainbow.

"The first lessons in surgery came to primitive man from injuries, accidents, bites of beasts and serpents, and wounds from war with other tribes."

So far as we know, there has never been a time in the history of man when he did not receive wounds; and out of man's sympathy for man he began to treat these wounds, and thus surgery began. One of the first problems presented was the control of haemorrhage. Little by little his experiences crystalized into useful knowledge.

Contrary to common belief, the ancients were by no means ignorant of the fundamental surgical problem presented in the treatment of bleeding wounds. Little or nothing is known regarding the surgical procedures adopted in such cases in China and Babylon; but in the case of Egypt, the third great culture land before the classical Grecian period, a flood of light has been thrown of late years on the status of medical knowledge in general and on the treatment of bleeding wounds in particular, notably through the discovery of the so-called "Edwin Smith" papyrus. It seems certain, however, that ligation of ruptured vessels was not known either to the Egyptians or Greeks, who derived the fundamentals of their medical knowledge from the Nile.

Aurelius Cornelius Celsus, famous Roman surgeon in the reign of Tiberius, who lived about 25 A. D., was the most important medical author of classical times next to Hippocrates. Ligation of bleeding vessels is first definitely referred to by him, but without mention of the source of his knowledge, seemingly as though the procedure were generally known and accepted. As regards arrest of haemorrhage, he says, "One should pack the wound in dry lint, and over this should be laid sponges pressed out in cold water. If the haemorrhage does not cease, the lint should

be renewed or moistened with vinegar. If this is not effective, other methods must be tried, but always the mildest first, not the caustic methods. If, in spite of all efforts, the haemorrhage is not checked, the bleeding vessels should be seized and ligated. In order that the veins may be caused to retract so as to bring about a closing of their openings, complete section of the vessels between the points of ligature is necessary. If ligature is not possible, recourse may be had to the cautery iron as a last resort."

A hundred years after Celsus, ligature of bleeding vessels was an assured possession of medical science. The procedure is exhaustively discussed by Galen (200 A. D.), whose writings are founded upon the doctrines of Hippocrates and anatomic and physiological knowledge as established by the Alexandrian school. With him, the technique of arrest of haemorrhage reached its highest point.

With other painfully acquired knowledge, that regarding the arrest of haemorrhage as practiced by Galen and his successors was lost in the dark ages and was not revived until the time of Ambrose Pare, the 16th Century. Pare lived from 1510-90 and was one of the greatest of army surgeons.

Thus slowly through the ages did the race finally acquire our modern technique for the control of haemorrhage.

Infected wounds were always with the race. Dr. Fred Albee of New York says, "Since time immemorial, infected wounds have been the surgeon's *Bete Noir*. The search for the ideal wound treatment is centuries old."

"Primitive man's wounds were dressed 'dry' with moss or fresh leaves, ashes, or natural balsams, and when poisoned, treated by sucking and cauterization with red hot irons. The spear and arrow wounds of Homers heroes were treated with healing ointments, pounded root, astringent anodyne; but after any of these had been carefully applied, appropriate incantations recited with much religious fervor were considered necessary to insure healing."

Religious influence was strong in medicine of the pre-Christian era. In our own time, Dr. Wil-Mayo says, "The church is still the great mother of hospitals."

"Celsus applied emollient salves to wounds and called on the gods to help. The Greeks invoked the aid of Apollo and Aesculapius.

"In 1100 A. D. we find more faith in sucking infected wounds than in dressing them with emollients, the most notable example being that

of Sybilla, beautiful wife of the Duke of Normandy, who, not caring to live if her husband died, sucked the poison from the dreadful wound in his thigh. She saved his life, but sacrificed her own.

"Then came the Middle Ages; and the more repulsive the wound remedy, the more efficacious it was apparently considered. Crushed body lice and incinerated toads top the list of horrors. A powder made from Egyptian mummies and known as "mummy powder" was extremely popular, as were herbs imported from the Orient, and therefore glamoriorus.

"In Ambrose Pare's time, it was a common thing for maggots to breed in a wound if the latter was left undressed for a single day; and the favorite precaution against wound infection was to pour into the wound tract boiling or molten pitch, in which elderberry bark had been dissolved.

"Ambrose Pare also seems to have given unusual importance to diet and the patient's comfort in the healing of infected wounds. Take the case of the Marquis d'Arnet, whom Pare treated for an infected wound of the thigh from an arquebus shot. The physicians who had been treating him for weeks before Pare was called had not changed the patient's linen in all that time for fear of disturbing the wound. Pare immediately ordered fresh clothing and bedding, made three openings in the thigh, took out bone splinters, cleaned the wound with boiling oil, put in drains, and applied plaster with a window. But his treatment did not stop there. He ordered that the patient be fed a succulent diet of broth and herbs, wings of partridge, plums stewed in wine, sorrel, chicory, marigolds, and a list of delectables that would almost make one envy the Marquis and his wound. Not only this; but for hours the patient was to smell flowers of henbane and water lilies bruised with vinegar and rose water with a little camphor. Artificial rain was to be produced to make him sleep. Viols and violin soothed him and a comedian was summoned by the doctor to make his patient merry. Is it any wonder that his convalescence was short?

"A poet has paraphrased the after treatment of wounds in those days:

'Use three physicians still,
First Dr. Quiet,
Next Dr. Merryman,
And Dr. Dyet.'

"By mere accident, Pare learned to doubt the efficacy of boiling oil as an anti-infectious agent.

After a battle in which many soldiers were wounded, the boiling oil in the great kettles behind the lines gave out. Pare desperate for the welfare of his wounded, used a cold mixture of yolk of egg, oil of roses, and turpentine. Then he spent a sleepless night, worrying lest they die for want of boiling oil. To his surprise he found in the morning that these soldiers were in better condition than those whose wounds had been treated by the routine method. Thereafter he used the cold dressing.

"The variety of ingredients used for poulticing infected wounds in different countries and different eras is amazing: herbs, ashes, blossoms and roots, bread and milk, linseed meal and boiling water, marshmallow water alone, or cold water mixed with saltpeter, vinegar and sal ammoniac.

"Gooch used a wax sheath to cover his wounds, and left them alone. If his technique were described in more detail we might find a resemblance to "Bipp" or the Orr treatment.

"The early German school, instead of salve-smearing, probed infected wounds unmercifully and filled them with quantities of lint. Wurtz of Basel, Switzerland, in 1576, protesting against this method, said, "Medicines belong in wounds, and not such rags. The pus is thereby obstructed and cannot come out through the bolted door as it needs to do, and as Nature eagerly forces it." Nevertheless the probe-and-lint practice persisted for nearly two hundred years. Richter later adhered to the principle that Nature accomplished the healing and all the surgeon should do was to remove grave obstacles.

"Bell insisted on the free and unobstructed flow of pus, and to that end introduced lead tubes. In 1760 lead preparations for wound treatment were introduced in France by Goulard of Montpellier."

We still have Goulard's solution, namely—Liquor Plumbi Sub-acetatis.

"To the end of the 18th century the dogma of the injurious effect of atmospheric air on wounds prevailed. Hence the popularity of Pare's mixture of egg yolk, oil of roses, and turpentine; it hermetically sealed the wound. To keep out air, bandaging was done with lightening speed, as soon as the salve-smearing process was complete, and the bandages changed "as seldom as cleanliness would permit." This does not mean 20th century cleanliness.

Hunter, in connection with his classic study of circulation and inflammation, remarked that

it was sometimes "just as well to let a wound alone."

The 19th century was one of antiseptics and caustic germicides introduced by Lister, to which we will return later.

The casual observer might well conclude that compound fracture wounds are of recent origin due to our so-called "machine age" with its great expansion of industrialism and its high-speed transportation both of which produce accidents; and because of accidents, fractures; and because of opportunities for great violence, compound fractures.

The conclusion would seem quite logical—nevertheless, when we go back to the dawn of history, we find that man was then receiving accidents which caused fractures, and amongst these fractures, some were compound.

G. Elliot Smith of the Government School of Medicine at Cairo, Egypt, states, "I have been fortunate enough to have had an opportunity of examining two sets of splints which have been applied to fractured limbs almost at the dawn of Egyptian history—roughly about 5000 years ago. These are certainly the oldest splints which have come to light in any part of the world, and with the exception of flint knives used for circumcision in Egypt in pre-historic times, they are the earliest surgical appliances ever discovered.

"These splints were discovered applied to the bones, by the Egyptian Expedition from the University of California in 1907. The first case was a fracture of the shaft of the right femur almost at the mid point. The subject was a girl of 14 years. This was a compound comminuted fracture. It was treated by an anterior and posterior splint and also two lateral splints made from the mid rib of the date palm.

"These splints only reached about three inches above the fracture but extended down to seven inches below the knee joint. They were padded with linen and tied in position by linen with a reef knot. The pads on the femoral surface were discolored by a rust-like stain, and on examination were found to be blood stains.

"Death must have occurred soon after the injury as there was no evidence of healing reaction.

"The splints could not have been of much use as a support to the broken bone or in preventing shortening from muscular action. They seemed to have been used more to immobilize the knee, and thus securing some degree of rest to the injured leg."

Mr. Smith says that an examination of a series of healed fractures of the femur obtained from ancient Egyptian tombs shows what in fact we might have anticipated from a study of these splints, that as a rule there is considerable shortening, displacement of fragments and an excessive development of callus.

The second case was a fracture of both bones of the forearm at about the middle. The splints were found still applied. These two cases were found in the same cemetery.

"The fracture was certainly compound, because there was a pad of blood-stained vegetable fiber, probably obtained from the date palm, still adherent to the upper fragment of the ulna and bandages: It was evidently pushed into the wound to stop the bleeding."

Mr. Smith says some of this palm fiber is still sticking to the broken surface of the bone and extends into its medullary canal.

"The broken arm was apparently treated by plugging the wound full of vegetable fiber, then the forearm was wrapped with a bandage of linen. These splints were applied, which seem to have a natural curve which adapted themselves to the arm. A gap between the splint at the back was filled in with a bundle of coarse grass. The whole was bound to the arm by a broad linen sheet, forming a tubular splinted dressing and finally secured to the arm by tape of a folded bandage.

"This case showed no healing process and death likely followed soon after the injury.

"The splints in this case were a far more effective support to the broken ulna and radius than the broken femur of the first case." Mr. Smith states that the ancient Egyptian surgeons treated fractures of the forearm very well as shown by specimens found and examined. Many deaths resulted from compound fractures because of the lack of knowledge regarding infections, the nature of which was not understood until the time of Louis Pasteur and Lord Lister, and so down through the years until very recent times, compound fractures and all other severe wounds were dangerous to life and limb. The story of one of the most famous fractures in history, which was compound, that of Percival Pott, illustrates the dangers as realized by the great surgeon in the handling of his own case. Dr. Howard Haggard in telling this story says:

"On a cold January day in 1756 there was an accident on Kent Street, Southwark, a suburb of London. Dr. Percival Pott, the fashionable London surgeon, returning from visiting a pa-

tient, was thrown from his horse to the rough cobblestone pavement, his foot struck against one of the round stones, his ankle turned sharply sidewise, and in consequence, the joint was dislocated and the smaller of the two bones of his leg was broken across, some three inches above through the flesh and skin. It was a serious injury, and particularly in those days before antiseptic surgery.

"A crowd of people quickly gathered about the injured man lying on the pavement. House doors opened; gentlemen, in knee breeches and periwigs, put down their port and 'The Gentlemen's Magazine,' and, flanked by butlers and footmen, pushed their way through the ring of street gamins and small merchants; alternately, they offered advice to the prostrate man and bowed pompously to neighbors. On the outskirts of the crowd the maids and footmen, having satisfied momentarily their morbid curiosity, took advantage of this legitimate interruption to their duties and fell to gossiping and flirting. A pickpocket and his accomplice stole softly through the crowd. A blackened chimney-sweep darted out of a shop, a bolt of cloth under his arm. For a moment, attention turned from the injured man to this minor attraction as the shopkeeper left the circle of spectators and dashed down the street after the diminutive thief; it was an unequal race and the sweep cast the bolt away; the merchant, like Atlanta in the fabled race with Hippomonenes, stooped to pick up the cloth; the sweep disappeared around a corner. The merchant returned, brushing the dirt off of his goods. He entered his shop. Attention again centered on the man with the broken leg.

"Volunteers offered to carry him into one of the shops; a gentleman vociferously shouted for his footman to fetch the carriage and take the gentleman wherever he might wish; another courteously offered the hospitality of his home. But Dr. Pott knew too well, in case of injury such as his, the grave consequences of rough handling and awkward position required by a carriage. He preferred to lie on the cold stones without moving until proper provisions could be made to transfer him to his home.

"Scenes such as these are, with changed surroundings, common today. You have seen accidents on the streets of our cities and watched the crowd gather. But there is one striking difference. The blue-coated figure of the policeman appears on the scene; calmly and authoritatively he controls the situation. A telephone call goes through to the nearest hospital; a moment later

the screech of the siren is heard, and through a traffic respectfully at a standstill the ambulance draws up; and the injured man is lifted carefully and born away to immediate medical aid. But this efficient provision for the injured is a very modern development. The first hospital ambulance service in the world was established in 1869, at Bellevue Hospital, New York City—more than a hundred years after Dr. Pott fell from his horse in the street of Southwark.

"In his day, neither were there hospital ambulances nor was there yet an adequate police service. In 1756, the reign of absolutely uncontrolled street hoodlums was barely drawing to the close under the influence of the police changes instigated by the great novelist, Fielding. Gangs of young men who assumed the name of 'Mohawks' still committed the most shocking and wanton atrocities on the passers-by in the open streets. Gangs called 'sweaters' gathered around inoffensive citizens, pricking them with swords to make them dance; the favorite amusement of the 'tumblers' was to stand women on their heads or roll them down hills in barrels; others practiced 'tipping the lion,' squeezing the nose of the victim flat against his face and poking fingers in his eyes. While these outrages went on, the poor, decrepit men of the watch stayed well out of the way, lest they be beaten and killed to provide further sport for the drunken rakes and robbers who swarmed the streets. Horace Walpole, in speaking of London in 1751, said, "One is forced to travel even at noon as if one were going to battle." A body of armed retainers was necessary to insure safety when going to the theater of an evening.

"When civic matters were in such a state, it is not to be wondered that for two hours on that cold winter's day Dr. Pott lay on the pavement while provisions were being completed for carrying him to his home.

"He directed the steps of his own rescue. A man was sent to Westminster to fetch two chairmen with poles. Next, he purchased a door, and when the chairmen arrived, he directed them to nail their poles to it. When this hard, flat stretcher was completed, he had the men lift him very gently, taking especial care not to bend his injured leg, and place him on the door. The chairmen then lifted the poles across their shoulders, and the strange procession made its way slowly through Southwark, over London Bridge, and into Watling Street, and so to Dr. Pott's home near St. Paul's Cathedral.

"A group of surgeons gathered around the bed

of their injured confrere. Dr. Pott, a greater surgeon than any of them, submitted to their opinion, for, as he said, he was convinced that no one could be a proper judge in his own case. The judgment of the group was that immediate amputation of the leg was necessary, and so the instruments were made ready for the operation.

"Those were days before antiseptics were used to treat wounds. More than a hundred years were passed before Lister was to show that infection in wounds is due to bacterial contamination, and can be controlled by antiseptics. In Dr. Pott's time a compound fracture was a very serious wound indeed, because of the blood poisoning that always resulted. So amputation was resorted to in such cases. But since the surgeons in their operation made no provision to control infection the outcome was likewise frequently fatal, although less often than in cases where amputation was not performed.

"The prospects for Dr. Pott's recovery were indeed bad. He consented to the operation, to be undertaken, of course, without anesthesia. Just before it was to be commenced, his old teacher at St. Bartholemew's Hospital, Dr. Nourse, arrived. He examined the injury and gave as his opinion that it might be possible to save the leg without operation. Consequently, the broken bone was brought into proper position and held there with bandages. No serious infection developed in the wound, and after the long convalescence Dr. Pott was able to resume his practice.

"But in a way, the injury was for him a fortunate occurrence. In the weeks during which he lay in bed he conceived the idea of writing books and papers on surgical matters. And so, at the age of forty-three, he embarked on his career as a medical author, a very successful one. In his pages is to be found the first exact description of the kind of fracture that he suffered from, a rather common variety. In his honor, it has ever since gone by the name of Pott's fracture."

In more recent times another compound fracture of gun shot origin was of great interest to the medical profession, and also to the general public. In a recent biography of President Garfield, Caldwell details many of the facts here mentioned. On July 2, 1881, President James A. Garfield, in company with the Secretary of State, James G. Blaine, entered the Baltimore & Ohio Railroad depot at Washington enroute to Williams College in New England where he hoped to give his two boys, now ready to enter college,

"a personal introduction to the institution where he himself had gone so long ago and from so different an environment." At 9:20 A. M., as he passed through the depot he was shot by Charles J. Guiteau, "apparently half-crazed, ill-balanced, disappointed office seeker whose worthless life had been a series of sordid failures. Now feeling in some strange way that he had a great political mission to perform, had for days been stalking the path of his unsuspecting victim." The bullet was fired from a British bulldog revolver which carried a .44 central fire cartridge, powder 20 grains, weight of bullet 200 grains. The President was fired upon at a distance of eight feet from behind. Two bullets were fired. One merely grazed the President's arm. The other produced the following injuries from which the President finally died on September 19, 1881:

First: A compound, comminuted fracture of the 11th rib left side.

Second: A compound fracture of the 12th rib left side.

Third: A compound, comminuted fracture of body of first lumbar vertebra, and the breaking off of the border of the twelfth vertebra.

Fourth: A wound of the splenic artery.

The surgeon in charge of the case was Dr. D. W. Bliss of Washington, who had been originally summoned by the Secretary of War, Robert T. Lincoln, but who partly because he had once been a neighbor in the Western Reserve, Garfield himself selected as his chief physician. Other physicians connected with the case were Surgeon General J. K. Barnes, Dr. J. J. Woodward, and Dr. Robert Rayburn, and July 3rd, the celebrated Dr. D. H. Agnew of Philadelphia and Dr. F. H. Hamilton of New York were summoned and were after that time closely connected with the case. Dr. Agnew was a teacher of one of the greatest surgeons of our time, the late Dr. John B. Deaver. President Garfield became seriously ill. Sepsis developed, abscess and sinus tracks had to be opened. Parotitis with gangrene and a discharging ear developed as complications, and finally a splenic artery haemorrhage took the life of the President. This was at the beginning of the Listerian Age and the beginning of antiseptic methods as advocated by Lister, but which had not developed into the more perfect methods of today. The doctors also had the disadvantage of not having the use of the X-ray. Everything possible was done for the President, but compound fractures were still very dangerous.

It was nearly 5000 years from the time of the two compound fractures related as the first

known in history, to the time of Dr. Pott's fracture, and yet how slowly and slightly knowledge had advanced in the treatment of wounds and compound fractures as compared to the advancement made in the 186 years since Dr. Pott's compound fracture, and the 50 years since President Garfield's gunshot fracture.

Garrison's "History of Medicine" says: "The great Lister had been deeply impressed with the high mortality from such surgical pests as septicaemia, pyemia, erysipelas, tetanus, and hospital gangrene. In his own statistics of amputations he found 45 per cent of fatal cases. These were the days of 'laudible pus' yet Lister had already begun to think of the old Hippocratic healing by first intention as the surgeons' ideal.

"Noticing that the latter, when attainable, was always dissociated from putrefaction, his attention was drawn accidentally to Pasteur's work, and immediately grasping its tendency, he set out definitely to prevent the development of micro-organisms in wounds. Perceiving that Pasteur's heat sterilization would avail nothing, here, he turned to chemical antiseptics and after trying out chloride of zinc and the sulphates, he hit, by lucky chance, upon carbolic acid, which had been employed a short time before in the disinfection of sewage at Carlisle. On August 12, 1865, he employed it in a case of compound fracture with complete success, and in 1867, published the results of two years' work, the report of which bears the significant title, "On the Antiseptic Principle in the Practice of Surgery." Lister proceeded to develop his thesis in the broadest and most scientific manner by original investigation of lactic acid fermentation, of the relation of bacteria to fermentation and of the antiseptic healing of wounds. He boldly applied the antiseptic principle to such conditions as abscesses in the spine and the joints excision of the knee joint, 1878; operations on the breast, 1881; fracture of the patella, 1883; and all manner of operations on the locomotor system, doing as much to extend the domain of surgery as any man of his time.

"Modern surgery, it is true, has become almost entirely aseptic in the sense of discarding strong antiseptics in the dressing of wounds, but in both, the Listerian ideal of avoiding sepsis remains the same.

"Pasteur is memorable for his work on fermentation, 1857; diseases of wine, 1863; diseases of silk worms, 1865; micro-organisms in beer, 1871; virulent diseases (anthrax chicken cholera, 1877); and preventive vaccinations, 1880; particularly of Hydrophobia, 1885. Because of

Pasteur's early work in organisms, Lister was able to apply this knowledge to surgery and the prevention of 'laudible pus' infection, and in 1874 Lister wrote Pasteur his celebrated letter, acknowledging the value of Pasteur's work in relation to antiseptic surgery."

And so one more great step was made along with the development of better wound treatment and thus better treatment of compound fractures and the improved surgery of today.

Before the days of Lister, in wide open wounds of the legs and arms, an amputation was the rule. During the Civil War period, all compound fractures were marked for amputation. No one could have been more conservative than Lister, who simply disinfected with carbolic acid—yet he revolutionized not only the treatment of compound fractures, but of all surgery.

Surgeons emboldened by the armamentation of antiseptic surgery increased operation intervention of compound fractures, which reached its height in Von Volkman's brilliant results in 1887 by his operation termed debridement.

Following the work of Lister in the treatment of wounds, which included compound fractures, based upon the discovery of Pasteur, perhaps the next great step in the treatment of severe infection and mangled wounds was the treatment developed by Carrel and Dakin, the so-called Carrel-Dakin treatment, during the World War. Hawley says, "From my experience I describe the war fractures and wounds somewhat as follows:

"This type of fracture wound was very much like one produced by making a small wound, introducing a bit fastened to a brace, chewing up the soft part of the bone in all directions, then doing the same on the opposite side, and finally through a long needle injecting three to five different kinds of anaerobic organisms, plus the hemolytic streptococci; such a compound fracture is difficult to duplicate in civil life."

From this apt description of Hawley's it is easy to imagine the difficulties that would arise in the way of infection, from such a wound and the Carrel-Dakin treatment, developed as a necessity, seemed to meet this situation better than any treatment up to this time. It was promptly adopted by such well trained industrial surgeons as Sherman of Pittsburg, and Noland of Birmingham, and has been generally adopted in industrial practice up to the present time.

Bloodgood wrote that the Carrel-Dakin method of treating infected wounds was one of the great surgical discoveries of the century.

During the World War, Mr. Morrison of

England used a Bismuth Iodoform-paraffin paste commonly called "Bipp" in the treatment of septic wounds.

Not long after the war the pendulum swung violently, and it was advocated that a septic wound involving bone—after the initial opening—should be packed with vaseline gauze and the whole encased in plaster paris, and left untouched for many weeks.

This at first was considered a revolutionary measure, inasmuch as it was contrary to established custom, but in actual fact it was the materialization of preceding ideas and an extension of the general principles of rest in the widest sense.

This method is the so-called Orr method. It has been used by Dr. Orr, of Lincoln, Nebraska, a number of years. He says, "My plan with regards to these compound fractures for almost ten years has been to reduce the fracture at once by whatever scheme of traction is necessary, and then to hold the fracture in place by including my traction devices, whether adhesive plaster, ice tongs, pins, or whatever I may use, in the plaster paris cast in such a way as to give a real *fixed fracture*. I make the treatment of the wound secondary instead of primary. I give it a primary cleaning up, carrying clean-up operation, or debridement to whatever extent necessary to provide a wide-open, well-drained wound. Then fill this space with sterile vaseline gauze, put in a dry pad over the vaseline pack and then do no post-operative dressings whatever, no sutures or drainage tubes are used, and no post-operative dressings are done, as a rule. Sometimes because of bleeding or excessive discharge, a change in the dressings is necessary. If such a change is necessary, it is done in the operating room under exactly the same aseptic precautions as the primary operation.

"Immobilization in correct position maintained during the entire period of treatment, and it is usually found that the compound wound is healed as early as the fracture. In this was most of the post-operative complications such as osteomyelitis septicemia, and secondary foci of infection avoided."

Dr. Albee says, referring to the Carrel-Dakin and the Orr method, "With the World War came the Carrel-Dakin treatment, the acme of antiseptics. It combined qualities which no previous antiseptic had: It did not harm the tissues; it dissolved the wound exudates, and permitted the nascent chlorine which it contained to penetrate to the bacteria in the recesses of the wound.

"The results of the Carrel-Dakin method

proved so far superior that, early in the fall of 1918, I adopted it as the exclusive wound treatment. Of the 6,000 serious bone cases which came under my care at this Army Hospital, I can safely say that half owe useful extremities to conquest of wound infection by this method before reconstruction surgery was attempted.

"But in spite of these excellent results, there were obvious objections to the treatment and as the rush of war surgery abated, these objections gained more weight: The frequency of irrigation and dressings were distressing for the patient, arduous for the surgeon and associated with risk of re-infection. It also necessitated prolonged hospitalization, a serious drawback to any treatment. The softening of the cast by the fluid and the necessity of cutting a window for insertion of the tubes rendered immobilization, so important in bone cases, imperfect; and also induced edema in the wound granulations and surrounding soft tissues within the area of the window, and unfavorable condition for wound healing.

"Under the Carrel-Dakin method, disinfection was in a sense working at cross purposes with immobilization and with the ultimate goal, bone repair.

"In 1923, Orr proposed a method for treating wounds which was the absolute antithesis of the Carrel-Dakin. For antiseptics, he substituted a vaseline dressing without germicidal power; instead of perpetual interference, he put on a cast and let the wound alone for weeks. For some time I hesitated to try this treatment; for, excellent as Orr's results were, the method seemed absolutely empirical and contrary to all previous conceptions of wound dressing and drainage. Finally, however, the annoying features of the Carrel-Dakin treatment of bone wounds, particularly its interference with immobilization induced me to give the new method a trial.

"I shall never forget with what trepidation I 'unearthed' that first case of Orr treatment. The dressings under the cast were soaked with fetid pus. But as soon as the packing was removed and the wound wiped off, I was reassured by beautiful glistening red granulation tissue, as healthy as in the most satisfactory Carrel-Dakin treatment.

"However much the vaseline and vaseline gauze method might seem to violate the traditions of free drainage, it was obvious that the process was sound. Soon after operation the patient's temperature had dropped to nearly normal and remained so during the eight weeks that the dressings were undisturbed. This fact and the healthy appearance of the granulations showed

that instead of toxins being absorbed, they had been thrown off into the pus soaked dressings.

"Orr's explanation (rest, immobilization, non-interference, and avoidance of re-infection) did not seem to me to account fully for the marked and unexpected success of the treatment and observation of several cases convinced me that some unusual phenomenon was befriending both patient and surgeon.

"In 1921, d'Herelle, a French bacteriologist at Yale University, claimed to have found an ultramicroscopical parasite of pathogenic bacteria which had markedly beneficial effects in certain acute intestinal diseases, such as bacillary dysentery and cholera. This parasite is called the "bacteriophage" because it lives on virulent pathogenic bacteria and destroys them, thus in many instances saving the patient's life. There were, he demonstrated by laboratory experiment, several varieties of "races" of phage, each with a preference as to the type of bacteria it would destroy; but also having certain adaptable destructive influences toward other strains of bacteria."

Dr. Albee believes that a "bacteriophage" accounts for the success of the Orr treatment. He says when one closes up the wound with vaseline gauze, and plaster cast, it is teeming with infection. When one removes the dressing eight weeks later, the wound is clean and healthy. Whatever agent cleared out the offending infection appeared spontaneously as on d'Herelle's slant culture, for none had been introduced. And the long lapse of time just as in his experiment, permitted this natural agent to carry on its bacteria-destroying action to a successful end. Was it not logical to assume that the phage principle had been working in the wound?

There are thus open to us two methods of combat. One may kill the bacteria with a strong chemical which parallels the Carrel-Dakin treatment; or he may let a parasite fight the battle instead, or still another. He may also use viable antiseptics in the form of the new maggot therapy, the historical background of which I would like to mention. Dr. Weil, of Pittsburgh, speaks of Goldstein's excellent review in which he says, "The maggot adventitiously introduced into the unprotected wounds of man and animal has undoubtedly saved many lives and a summary of certain facts supporting such views may be of assistance in establishing the importance of this problem." Records pertaining to the adventitious presence of maggots in human wounds date back to antiquity, and a digest of these records conforms closely to the important facts expressed by

Baron Larrey in 1829, namely: "These insects accelerated cicatrization by shortening the work of nature and by producing an elimination of the necrotic cells by devouring them without disturbing living tissue." (Baron Larrey was Napoleon's physician. In his will Napoleon left 100,000 francs to "Larry, the most virtuous man I have ever known.") Such were the findings in the days of "laudible pus" when conditions aided maggot development, a feature which was brought to my attention by an elderly male nurse at the Mercy Hospital in 1910, when he referred to the elimination of infection and the reduction of pus development by the presence of maggots in the packing of sawdust surrounding compound fractures, a method in use before the advent of antiseptics.

"These important facts attracted the attention of various surgeons during the World War, such as Crile, Martin, Slesinger, of England, and others, but notably the late Dr. W. S. Baer, whose experience of encountering a healthful condition of the wounds of two neglected soldiers after they had become infected with maggots stimulated his interest in the investigation and development of this new method of viable antiseptics.

"Records of the deliberate introduction of maggots into infected wounds were almost nonexistent until Dr. Baer announced his maggot treatment for chronic osteomyelitis in 1930. A treatment, doubtfully placed in the category of deliberate introduction, is that used by the Maya Indians for the removal of superficial malignancy, in which a dressing of beef blood, after having been ceremoniously exposed to the sun "when flies deposited eggs on it," was placed over the tumor and in a few days was noted to pulsate (due, of course, to the wriggling of maggots). However, the credit for the development of maggot therapy upon a scientific and practical basis must be accorded to W. S. Baer."

I shall not mention other modern methods of treatment of wounds and their complications such as tetanus and gas gangrene. They belong to our own time. With them we are all familiar.

A historical sketch such as this does not furnish much information that will assist the surgeon in his daily work, but he may learn from history that, quoting from Dean Lyon, "Knowledge does not come by inspiration, but rather is the slow growth of the operation and experience of men." Says Tennyson, "Science moves but slowly, slowly, creeping on from point to point."

From history we learn that we have witnessed greater progress in surgery and wound treatment during the period of our own lives than had occurred in the 5,000 years up to our time. We may realize from the study of history the slow and painful struggle for knowledge and truth in medicine along the steep and jagged path to "Modern Rational Medicine."

If we learn anything from history, it is that man has never been content to stand still. He has always progressed or dropped back, but in the sum total he has greatly progressed from the darkness of his primitive state. From the study of history, we come to realize the great debt we owe to our ancestors, for had they been content to stand still, stagnate and degenerate, the race would never have emerged from the cave man period, and it would have been impossible to have reached our present high estate. Our heritage from the past is a priceless one. It was necessary to have this heritage in order to build the structure of medicine as it is today, and in contemplation of this we come to realize our own great responsibility to succeeding generations that are to follow us. We must give to them this priceless heritage and more. We must add to this priceless heritage, and they in turn must do the same.

Thus does the race progress and make the world a better place to live in. For, in spite of our modern science and our great machine age, we are still far from the goal of all truth: We are still like Sir Isaac Newton, who said—when honored for his great learning and discoveries, "I am still as a small child playing on the seashore with the great ocean of truth still undiscovered before me."



The Experimental Production of Urinary Calculi in Rats*

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INVESTIGATIONS dealing with the experimental production of urinary calculi have been reported in a previous communication. The basis for this investigation was suggested by certain clinical observations which would lead one to infer that a definite relationship exists between the formation of stones and the absence of certain elements in the diet. It has been observed frequently that so-called stone areas exist in certain countries.

EXPERIMENTAL PROCEDURE

In experimental investigations involving dietary changes, extreme care must be exercised and careful preparation is essential to preclude misinterpretation of results. While this experimental work deals with a deficiency of vitamin A, the diet must not be deficient with respect to other vitamins. It is not alone necessary that the diet contain the other vitamins, but it also must contain sufficient calories and must be palatable, at the same time including proteins, fat, carbohydrates and mineral salts in the required proportions. The animals used in this experiment were albino rats age twenty-five to twenty-nine days at the beginning of the experiment, and they weighed not less than 35 nor more than 45 grams. The salt mixture used was that of Osborne and Mendel, consisting of

Sodium chloride	0.173 grams
Magnesium sulphate (anhydrous) ..	0.266 grams
Monosodium acid phosphate	0.347 grams
Potassium acid phosphate	0.954 grams
Calcium acid phosphate	0.540 grams
Iron citrate	0.118 grams
Calcium lactate	1.300 grams
The complete diet consisted of	
Casein	18 per cent
Dextrin	65 per cent
Olive oil	10 per cent
Dried brewer's yeast	2 per cent
Salt mixture	5 per cent

With this diet, the food requirements of the animals were adequately fulfilled.

When vitamin A is completely lacking in the diet, careful observation of the rats is necessary to prevent their early death. When an animal becomes sick and its resistance is lowered it is eaten by the stronger rats. Xerophthalmia occurs

usually in approximately twenty-five days. In my experiments, when signs of this condition were present, in order to keep the animals alive for a long period of time, vitamin A was added to the diet occasionally for a few days, and then again withheld.

RESULTS OF THE EXPERIMENT

Two hundred albino rats were placed upon a vitamin A deficient diet. Fifty animals were used as controls. In one of the control rats examined *post mortem* at the end of 200 days, sand was found in the bladder. No urinary calculi were found at necropsy in the remainder of the control animals.

For the first thirty days of the experiment, bladder stones occurred infrequently in rats living on a diet deficient in vitamin A, and after that, the number of calculi increased rapidly. At the end of 200 days, 88 per cent of the rats showed bladder calculi. Renal calculi developed later than bladder stones and none was found at autopsy in the kidneys of rats that had had the vitamin A deficient diet for less than sixty to ninety days. At the end of 250 days, renal calculi were present in 41 per cent of the rats examined at necropsy. In many instances, renal and bladder stones were found in the same animal. The vesical calculi as a rule were considerably larger than those found in the kidney. Infection of the bladder did not occur until the special diet had been administered for thirty to sixty days, and xerophthalmia, which was evident in twenty-five to twenty-eight days, was the first evidence of the development of infection.

Renal infection was present and first noted after the rats had received the vitamin A deficient diet for a period of sixty to ninety days and in all cases in which renal infection occurred a co-existing bladder infection was present. Invariably bladder infection was pronounced before any evidence of kidney infection was demonstrable. In a second series of 100 rats, quite similar results were noted both as to the production of calculi and as to the incidence of infection.

The calculi produced in these rats varied in size from 0.5 to 6.0 mm. in diameter. They are usually spherical and light brown. The calculi contain chiefly calcium phosphate with occasional

*Read before the South Dakota State Medical Association, Huron, S. D., May 17, 1933.

traces of carbonates. There is present also a small amount of mucoid substance. No oxalates or uric acids are present. Many of the calculi found at necropsy could not be demonstrated roentgenographically.

To ascertain whether deficient intake of the other vitamins might be a causative factor in the production of urinary calculi, a similar group of experiments was performed withdrawing the other vitamins from the diet. But in these animals, calculous formation did not occur, even when the rats were allowed to live from 200 to 250 days.

The question now arose as to whether there is a specificity in the production of urinary calculi of the organism found by taking urinary cultures in these animals. Following the investigation of Rosenow and Meisser in which they produced foci of chronic infection by devitalization of teeth in the experimental animals and by filling the pulp cavity with an emulsion, I performed similar experiments on rabbits, in order to ascertain whether the streptococci isolated from the bladder of rats having calculi exhibited this specificity. When the suspension of material from the bladders of the experimental rats was injected by the intravenous route into rabbits, no calculi were formed. It is true that infection of the urinary tract developed, but there were abscesses and infection also in other organs.

In considering the frequency of urinary calculi produced in rats by diets deficient in vitamin A, a number of etiologic factors may be involved, such as urinary infection and keratinization of the epithelium of the genito-urinary tract.

That these changes are instrumental in the production of calculi seems to me unlikely, as no evidence for concluding that desquamation might give rise to a nucleus could be deduced from careful examination of the calculi. Alkalinuria is a constant finding in rats maintained on a diet deficient in vitamin A. This constant finding suggests the possibility of the relationship of colloids, colloidal suspensions and crystalloids in the formation of urinary calculi.

It is my impression that with the long-standing persistent alkalinuria, produced on a diet deficient in vitamin A, the crystalloids are constantly increased to a point where the protective action of the true colloids is not sufficient and calculi begin to form. This mechanism, combined with the infection of the genito-urinary tract, usually present in animals having had a lack of vitamin A, causes a rapid enlargement of the calculi.

Holmes and Coplan have called attention to the inadvisability of prolonged over indulgence in citrous fruit. They cite three cases in which

patients partaking constantly of citrous fruits were shown to have numerous and large clumps of phosphates in the urine. In these patients, the clumps were sufficiently large to obstruct the outflow of urine from the bladder. Two of these patients had had definite attacks of ureteral colic.

Thus it seems plausible to assume that when the urine is persistently alkaline for a long time, the protective mechanism of the colloids is sufficiently disturbed to permit calculous formation. It is further of interest to note that by adding ammonium chloride to the diet of rats being sustained on a diet lacking in vitamin A, thus changing the reaction of the urine to acid, the number of animals in which calculi are formed is decreased. Likewise, by adding vitamin A to the diet, which also changes the reaction of the urine, the formation of stones is prevented.

The question naturally arises as to whether after calculi have formed, they can be caused to disappear. Sixteen rats in which calculi have been demonstrated by roentgenograms, were subjected to this experiment. In one of these, four small calculi in the bladder of such size that they could not be passed spontaneously, disappeared after vitamin A had been added to the diet for five weeks. In eleven of the rats, the stones disappeared from five to seven weeks after vitamin A had been added to the diet. This included four in which there were kidney stones. In the other five rats, although the stones were definitely smaller, they were still demonstrable by roentgenograms eight weeks after the vitamin A had been restored to the diet.

I am now investigating a series of five patients with bilateral kidney stones and one patient with a stone in the lower calyx of the kidney. One of the patients with bilateral calculi has been observed for forty-six months, and no calculi have been passed until recently, since she has been taking a high vitamin, low carbohydrate diet for four months. Roentgenographic study shows that many of the shadows present on previous examinations now are gone. The urin at present is loaded with sand, a finding that would seem to indicate that the stones are disintegrating. In one of the other patients who has had the same diet for three months, the calculi are definitely smaller, according to roentgenograms. The stone in the lower calyx of the kidney has diminished considerably since the patient has been given the high vitamin, low carbohydrate diet. The other patients have not had the diet for a sufficient length of time to warrant drawing any definite conclusions. Likewise, the results in the few patients who have been subjected to this clinical test are too incom-

plete to make justifiable any definite conclusions regarding the efficacy of this treatment for urinary calculi.

CONCLUSIONS

1. Albino rats maintained on a diet deficient in vitamin A develop bladder and renal calculi.

2. Alkaline urine is a constant finding in these animals.

3. Keratinization of the epithelium of the genito-urinary tract occurs after the animals have had the vitamin A deficient diet for about ten weeks.

4. Bladder calculi produced by lack of vitamin A disappear when cod liver oil is added to the diet.

5. Genito-urinary infection is frequent in the late stages of the experiment but in the early weeks of the experiment, calculi are frequent before infection is evident.

6. An effort is being made to apply the findings of this experimental study in the treatment of some patients with renal calculi.

REPORT ON THE OUTBREAK OF ENCEPHALITIS IN ST. LOUIS, MISSOURI

(Continued from Page 511)

indefinite spread, with rarely a second case in the same home, control measures obviously must be empirical. In St. Louis the City Department of Health isolates all diagnosed cases for a period of twenty-one days from the date of onset. No placard is affixed to the home and no restrictions placed upon members of the family other than that they must not visit the sick room. The isolation of the patients must be as complete as possible. Should death occur private funerals are required.

Encephalitis as we have known it frequently leaves residual conditions. Some form of paralysis is not uncommon. A change in personality, especially in the younger age groups has been markedly apparent. A further condition has been a relatively slow convalescence. In the St. Louis outbreak these conditions are changed. The patient makes a rather rapid and uneventful recovery. It has not yet been determined that subsequent degenerative changes might be found. In order to check this situation the St. Louis Department of Health plans to follow-up all cases of encephalitis in their outbreak for three, six, nine and twelve months after recover to determine if possible any latent or late developments in conditions resulting from the disease.

The appearance of encephalitis in a community can not be predicted. The restriction of the out-

break to St. Louis and its immediate vicinity over a period of two months without spread removes the fear of the appearance of the disease in other sections of the county, as so frequently happens in communicable disease outbreaks. However, no preventive measures can be instituted to shut off the introduction of encephalitis, and so far no means have been discovered which will in any way curtail a sharp or sporadic outbreak. Should there be definitely demonstrated a contagious element, definite quarantine restrictions must be instituted. In the absence of such positive demonstration certain restrictions are advisable. It is, of course, necessary to recognize the existence of the disease when it appears and to notify the Health Department promptly so that such restrictions as are justifiable can be instituted.

Every sudden rise in a patient's temperature not otherwise definitely accounted for should be looked upon with suspicion. The principal outstanding symptom of headache should point to the possibilities of encephalitis. The stiffness in the neck muscles should make a diagnosis almost conclusive. Patients presenting these early symptoms, even though they should be mild and though the course of the disease might be much restricted, spinal puncture should be performed and if spinal fluid is under pressure the diagnosis is as complete as is possible to make. Every instance of illness presenting these symptoms or any one of them, particularly fever, should be isolated until a diagnosis can definitely be made.

If encephalitis is a disease corresponding to the knowledge we have of poliomyelitis it may be assumed that human carriers of the infection exist and that the infection may be spread from person to person. Should encephalitis appear certain restrictions of the household will be necessary. More stringent regulations on quarantine and isolation may have to be applied as knowledge of the disease is gained. The control of encephalitis can be successful only by complete and unrestricted co-operation. Physicians must report all cases and all suspects and not endeavor to shield the patient or delay diagnosis until all cardinal symptoms appear. Perfect frankness on the part of the patient is also necessary, and conformity and compliance with any restrictions required must be heartily made. There is no reason to believe that encephalitis either of the usual form or the form prevalent in St. Louis will be found in Minneapolis. Should it appear, however, no known means of prevention should remain untried to prevent if possible an epidemic.



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WILL GROUP HOSPITALIZATION SUCCEED?

In an editorial last April we said that we might soon have some convictions about this group hospitalization movement. It has not reached that stage yet where we can acclaim it a success nor yet declare it a very great failure but certain things seem clearly to stand out even now.

It appears to be not evolutionary but revolutionary. It has some of the ominous possibilities of the modern racket. It proposes to reduce the cost of medical care by allowing the promoters to take profit. It contemplates solicitation by an intermediary person or agency. We submit that it is absurd to think of reducing the cost of medical care by increasing the salaried personnel and the bills payable, that solicitation is unethical and that neither commercialism nor solicitation contribute to the good of the public. If the group hospitalization plan is to be a success, it must be under the management of those who minister to the sick rather than any lay group. It must be mutual without thought of profit making. A. E. H.

STERILIZATION OF THE MORON

Intelligent and useful families are becoming smaller and smaller. The irresponsible and defective parents do not limit the size of their family or limit the number of their children outside of wedlock. In fact, the lower the intelligence the greater the tendency to derive all their pleasures by overeating and sex indulgence. The families

who send children to institutions for feeble-minded are said to "average twice as large as families who send their children to the universities." What will be the result if the public does not protect itself? One-half of the citizenship will, in a few decades, be supporting the other half in institutions for feeble-minded, hospitals for insane, the jails and penitentiaries. Last year, a state with a small population had 1,642 in the hospital for insane and 700 in the institution for feeble-minded. After a survey of schools and other institutions by a psychiatric social worker, this state was found to have a mentally sub-normal population outside of those in the institution of 6,000. The moron is mostly of two types, the sexual problem and the criminal.

Many states have fairly workable sterilization laws. Perhaps California has the best. At any rate, California has been very successful with the sterilization problem, and leads the states having such a law in the number of cases, male and female who have submitted themselves to the operation. Up to January 1, 1933, the number reached 8,504 in California; Virginia was second with 1,333; and Michigan was third with 1,083. Twenty-nine states have more or less workable sterilization laws, and the remaining commonwealths are fast coming into line. Some of our marriage laws are mildly effective, but they do not affect the march of illegitimacy. Our feeble-minded institutions have whole families within their walls. Young girls have been committed

with from one to five illegitimate children. What is the medical profession to do about it? Society looks to us to pave the way.

The Human Betterment Foundation of California gives the following: "Effects of Eugenic Sterilization as Practiced in California."

1. Sterilization only prevents parenthood.
2. It in no way unsexes the patient.
3. It is a protection not a punishment and therefore carries no stigma nor humiliation.
4. It is approved by patients who have been sterilized.
5. It is approved by their families and their friends.
6. It is approved by medical staffs, social workers, probate and parole officers who have come in contact with the 8,506 patients sterilized in the last twenty-five years and up to January 1, 1933.
7. It permits many patients to return to their homes who would otherwise be confined to institutions for years, causing the homes to be kept together and preventing the breaking up of the families.
8. It protects children from being born, to be brought up by mentally defective and mentally diseased parents, or by the State.
9. It takes a great burden of expense off the taxpayers and enables the state to care for many more patients than otherwise would be possible.
10. It has been followed by a marked decrease in sex offences.
11. It enables many handicapped persons to marry and have a life normal in most respects who without sterilization could not be allowed to marry.
12. It is practically a necessary step to prevent racial deterioration.

The sterilization laws of many states are not efficient because too much red tape has been thrown around the whole procedure. Let us as physicians, educate the public to this so that the future may be saved.

J. P. A.

FOOD POISONING

The days of cholera infantum and large numbers of cases of severe gastro-intestinal disorders among adults have apparently passed in the Northwest, as evidenced by the low incidence of these conditions during the hot summer months of recent years. However, there is still the occasional outbreak from food poisoning which demands further work on the part of the medical profession. Under the term "food poisoning" are included two definite classes of intoxication, based on their etiology. One group may be termed

food infection, caused by the bacillus enteritidis or organisms belonging to the same group; the other group being *true intoxications*, due to toxins in the food, the bacillus botulinus being the first organism found to produce these toxins which are harmful to man. Recently, it was shown that staphylococci are capable of producing a substance causing food poisoning.

Food infection is an acute inflammation of the gastro-intestinal tract caused by the bacillus enteritidis (Gaertner's) or organisms closely allied to this. This infection is characterized by a short incubation period of six to twelve hours, sudden onset, nausea, vomiting, diarrhea and usually fever. This form of food poisoning is commonly incorrectly called "ptomaine poisoning." Rosenau says there is no such thing as ptomaine poisoning.

The exact frequency of food infection in the United States is not known, but it is probably less prevalent than is usually supposed. It appears to be more prevalent in Europe than in this country. The number of persons involved in outbreaks varies, depending on the source of the infection, milk usually causing the larger outbreaks. The prevalence of food infection is greatest in the summer months.

The total deaths from food poisoning (all forms) in the United States registration area in 1920 numbered 957, corresponding to a death rate of 1.1 per 100,000 population. True food infection with Gaertner's bacillus usually runs a mild course with a low case fatality rate.

Food infected with the bacillus enteritidis is, in most cases, not altered in appearance, taste, or smell, and for this reason cannot be detected. Meat foods are responsible for the majority of outbreaks. Milk, ice cream, canned fruits and salads may also be infected. Just what the source of infection in the food itself may be, is often difficult to determine. In the case of infected meat, the meat may come from animals which were infected before being slaughtered, or the meat may come from healthy animals and become infected after slaughtered by a careless butcher who has been handling diseased meat. It is now believed that human carriers of the b. enteritidis do not exist. Rats and mice, however, may be carriers and food may become infected from them.

In Baltimore in July, 1932, twenty-nine persons fell ill after eating custard-filled doughnuts. An investigation revealed the fact that the custard was allowed to remain unprotected and unchilled for some time before the filling procedure. The bakers had failed to heed the warning which had been issued the year before.

In Plumas County, California, during May, 1932, eight persons developed food poisoning in a lumber camp. It was traced to meat which had been allowed to stand on a warm stove and was not reheated before serving.

In 1932, three cases of acute gastro-enteritis, due to eating duck eggs, were presented before the Pathological Society of Great Britain and Ireland. One of these cases was fatal. In each case, bacillus aertrycke was isolated and was found in the eggs of the corresponding flocks of ducks. Further investigation revealed this bacillus in the spleen, ovary, intestinal contents, and some of the eggs of a high percentage of ducks examined.

In London, the County Health Council has made food poisoning a notifiable disease; that is, it is in the same list with infectious diseases, so that every case must be reported by the physician to the health officer of his district.

In 1914, Barber found that illness was produced by a strain of *Staphylococcus albus* in milk. When the organisms were taken in fresh milk no illness resulted, but if the milk was allowed to stand, it became poisonous. In 1930, Dack of Chicago reported an outbreak of food poisoning which resulted from the eating of a Christmas cake. Examination revealed a yellow staphylococcus in the food. When this organism was studied it produced a toxic substance in broth. This substance when taken by a voluntary worker resulted in nausea, diarrhea and prostration. In other words, the same symptoms were observed as had occurred among the persons who had eaten the contaminated cake. After careful bacteriological study of this staphylococcus, Jordan draws the following conclusions:

"These experiments show that various strains of staphylococci of diverse origin and different cultural characters are capable of generating in broth a substance which, when taken by mouth, produces gastro-intestinal disturbance. This substance is destroyed by boiling and is either destroyed or greatly weakened by being heated at from 60 to 65 C. for thirty minutes.

"It seems not unlikely that bacteria of other groups may produce similar substances that are irritating to the human alimentary tract."

PREVENTION

1. Careful inspection of all animals whose flesh is to be used for food.

2. Demand absolute cleanliness among all food handlers.

3. Proper refrigeration of foods.

4. Cooking food thoroughly, as these organisms are easily killed by heat.

J. A. M.

IN MEMORIAM—ALBERT FORREST LONGEWAY

The Rocky Mountain region and Montana especially, has lost one of its most versatile and forceful citizens in the death of Doctor A. F. Longeway. As surgeon, physician and friend he played an important part in the history of Montana. Because of ill health he was forced to give up his practice several months before his death. He died September 4, 1933 surrounded by his relatives and friends.

Doctor Longeway was born at Durham, Quebec, Canada, April 6, 1865. He graduated from the McGill Normal School in 1882 and from the Bishops Medical College of Montreal, Canada, in 1886. After practicing for a time in Canada, he came west July 4, 1887, shortly after moving to Great Falls where he practiced continuously for over forty-five years.

Doctor Longeway was the first Secretary of the State Board of Health of Montana. As Secretary he visited the University of Minnesota and was instrumental in the coming to Montana of Doctors Chowning and Wilson who launched the experimental work on Rocky Mountain Spotted Fever. With this beginning his interest remained in this work and he watched it grow until the United States Public Health Service took over the work and built a great Laboratory of a permanent character, at Hamilton, Montana.

Doctor Longeway was deeply interested in the hospitals of Great Falls. He and his associates built the first hospital in Great Falls, located on 32nd Street between Central and 1st Avenue North. Later this hospital was abandoned when the Sisters of Charity of Providence built the old Columbus Hospital.

Doctor Longeway occupied many public offices and was a member of many medical societies. He was an active member of the Cascade County Medical Society, The Montana State Medical Association, American Medical Association, National Association of Railway Surgeons and a fellow of the American College of Surgeons. As a physician and surgeon he was always helpful to the younger men of the profession, setting an example and offering them assistance at all times.

The Cascade County Medical Society has lost a valuable counselor and the people of Montana a spirited, true citizen and friend.

CASCADE COUNTY MEDICAL SOCIETY

SOCIETIES

MINNESOTA MEDICAL ALUMNI
ASSOCIATION

The annual clinical meeting of the Minnesota Medical Alumni Association Society will be held Friday, October, 27, 1933 at the University Hospital in Minneapolis. This meeting will be the day before the Minnesota Homecoming football game with Iowa. There will be a luncheon at the University Hospital for those attending the meeting. All persons interested in attending the meeting will be welcome.

MORNING SESSION

E. L. GARDNER, M.D., *Chairman*

- 9:00 A. M. "Skin Clinic," John F. Madden, M.D., St. Paul.
- 9:30 A. M. "Injection Treatment of Hernias," A. F. Bratrud, M.D., Minneapolis.
- 10:00 A. M. "The Role of Calcium in Medical Treatment," Reuben Johnson, M.D., Minneapolis.
- 10:30 A. M. "Childhood Tuberculosis," C. A. Stewart, M.D., Minneapolis.
- 11:00 A. M. Subject to be announced. Laurence R. Gowan, M.D., Duluth.
- 11:30 A. M. "Obstetric Comments," Fred L. Adair, M.D., Chicago.
- 12:30 P. M. Luncheon and Business Meeting, University Hospital. Richard E. Scammon, M.D., Minneapolis; Edward D. Anderson, M.D., Minneapolis.

AFTERNOON SESSION

O. S. WYATT, M.D., *Chairman*

- 2:00 P. M. "The Role of Arsenic in Causing Polyneuritis," W. D. Shelden, M.D., Rochester.
- 2:30 P. M. "Pyuria," W. Downing, M.D., Le Mars, Iowa.
- 3:00 P. M. "Symptoms of Refractive Error," Merritt W. Wheeler, M.D., St. Paul.
- 3:30 P. M. Surgery—Subject to be announced. N. O. Ramstad, M.D., Bismarck, N. D.
- 4:00 P. M. "Shoulder Joint Injuries," Joseph R. Kuth, M.D., Duluth.
- 4:30 P. M. "The X-ray in Treatment," Russell Gates, M.D., Minot, N. D.

MISCELLANEOUS

TO THE MEDICAL PROFESSION IN
NORTH DAKOTA

I again call attention to the fact that no person can practice medicine and surgery in North Dakota until duly licensed by the State Board of Medical Examiners, and every person so licensed must pay an Annual Registration Fee.

I might state that so far as I know, every person practicing medicine and surgery at present in this state has a 1933 registration card. If there is any doubt in the mind of any practicing physician as to some person practicing without a card—write me.

Now, I want to get this firmly fixed in the mind of every licensed man in this state. The Board of Medical Examiners makes rules and regulations for the licensing of physicians and instructs the Secretary of the Board to enforce such rulings. They have also employed a General Counsel to advise the Board on legal problems. But a constant source of annoyance the Secretary has is interpretation of Board rulings by the members of our profession who know nothing about them. Some person who wishes to locate in the state will talk with doctors who might for certain reasons want to get a man located in some small town in his territory and tell him it will be all right for him to begin practice any time and take the examination when next given. Usually they have not investigated this applicant—know nothing about his qualifications, his ethical or moral standing.

I ask you again to refer all these cases to me. I will do what investigating is necessary and certify them to the Board for examination. If found qualified, a license will be granted. The verage practitioner has no means of knowing qualification of men who seek license. We want well qualified, ethical and moral men to come to our state, but the Board must be satisfied on all points before a license is granted, and I further state that the Medical Practice Act of 1911 does not permit any person to practice medicine or surgery in this state until duly licensed by the Board of Medical Examiners; this law is further fortified by the Annual Registration Act of 1931.

Embarrassing situations arise on account of meddling interference by men not in any way connected with the administration of the Medical Practice Act, and I hope it will not be necessary to call your attention to this again.

G. M. WILLIAMSON, M.D.,
Secretary, N. D. State Board Medical Examiners.

NEWS ITEMS

THE AMERICAN MEDICAL ASSOCIATION DIRECTORY

Following instructions from the House of Delegates last June, the A. M. A. Directory is now being revised for publication within the next few months. It is urged that members delinquent in their state dues now remit promptly as the next publication of the Directory probably will not be until 1936. One of the advantages of being listed in the Directory as of the A. M. A. is the fact that certain types of appointments, including commercial positions, require membership in the national organization.

Dr. J. C. Murphy, formerly in general practice at Kadoka, is now located at Murdo, S. D.

Dr. E. N. Sorenson, formerly at Tyler, has moved to Round Lake, Minn., where he will continue general practice.

Dr. D. L. Kegaries, Rochester, Minn., is now located at Rapid City, S. D., where he has opened offices for general practice.

Dr. J. J. Stratte, who practiced medicine at Hallock, Minn., during the past ten years, has moved to Grand Forks, N. D.

Dr. G. A. Carmichael, a graduate of the University of Michigan, has recently opened offices for general practice at Butte, Montana.

Dr. W. A. Wright, Williston, N. D., has been named County Physician of Williams County and will take charge of the work at once.

Dr. Henry M. Wheeler, formerly of the Mayo Clinic, Rochester, has decided to locate at Mandan, N. D. and join the Mandan Clinic Staff.

Dr. M. J. Fardy, Minot, N. D., has returned from a four months trip abroad where he did special post-graduate work in Vienna and Paris.

Dr. C. H. Clark, Browns Valley, Minn., had decided to construct a modern hospital in that city, which has been greatly needed for many years.

Dr. G. J. Van Heuvelen, formerly of Mitchell, has purchased the practice of Dr. R. A. Phillips, at Elk Point, S. D., and is already settled in his new offices.

The members of the Lake Region Medical Society held a picnic at Lakota, N. D. last month, with Dr. H. F. Emert, Sarles, being the principal speaker.

Dr. Robert S. Bole, St. Paul, who had been the chief physician for the Twin City Transit Co. for over 30 years, died last month at the age of 73 years.

Dr. Norman Lende, Faribault, was recently married to Miss Marlys Miley, of Glencoe, Minn. Dr. Lende was a graduate of the University of Minnesota in 1928.

Plans have been about completed to continue the Government Indian Hospital at Canton, S. D., as many of the smaller hospitals scattered over the Northwest will be obliged to close.

At the September meeting of the members of the medical society held at Watertown, S. D., Dr. M. O. Henry, Minneapolis was the guest speaker, his subject being "Fractures of the Hip."

Dr. S. W. Harrington, of the Mayo Clinic, Rochester, was a guest speaker recently at a meeting of the Parents-Teachers association at Willmar, Minn., his subject being "The Matoux Test."

Claiming that they have given thousands of dollars of work without receiving any pay, the doctors of Winona, Minn., are complaining to the city council and asking them to pay the bills in the future.

At a recent meeting held at Milwaukee, the American College of Hospital Administrators was organized, with J. G. Norby, superintendent of Fairview Hospital, Minneapolis, one of the vice-presidents.

Dr. Richard E. Scammon dean of medical science of the University of Minnesota, was the principal speaker at the monthly meeting of the Washington County Medical Society held at Stillwater, on September 12th.

Dr. W. A. Allen, Rochester, Minn., at the age of 99 years, is still calling on his regular patients. The doctor seems to be in the best of health and spirits, he has never used tobacco or liquor, and spends only four hours in sleep.

Dr. M. J. Fardy, Minot, N. D., was seriously injured by being held up by a band of robbers, who relieved him of all of his valuables, even taking a part of his clothing, then beating the doctor into a senseless condition.

Joseph Christian Ohlmacher, M. D., Professor of Bacteriology and Pathology of the School of Medicine of the University of South Dakota, has been appointed Dean of the School of Medicine, University of South Dakota.

Dr. Maurice G. Milan, one of Aberdeens prominent physicians passed away after a few days illness, pneumonia being the cause. Dr. Milan was 47 years of age, and a graduate of the Georgetown University, Washington, D. C.

Dr. Arthur C. Strachauer, Minneapolis, delivered the address in surgery at the eightieth anniversary meeting of the Dubuque Medical Society, Dubuque, Iowa, on the subject of "Cancer of the Rectum and Large Bowel," September 12, 1933.

At the annual meeting of the Northern Minnesota Medical Association held at Willmar last month, the following officers were elected: Dr. A. C. Baker, Fergus Falls, president; Dr. J. F. DuBois, Jr., Sauk Center, vice-president and Dr. O. O. Larson, Detroit Lakes, secretary.

The Woodbury County Medical Society will entertain Dr. Arthur E. Hertzler of Halstead, Kansas at their regular evening meeting, October 24, at the Martin Hotel, Sioux City, Iowa. Dr. Hertzler will discuss "Modern Slant on the Diseases of the Mammary Glands." Visiting physicians cordially invited.

Dr. A. F. Longeway, Great Falls, one of Montana's best known physicians, where he had been in active practice since 1887, passed away on September 6th. The doctor had been surgeon of the Great Northern Railway for over 40 years. During his long residence in Montana, he was regarded as one of the most outstanding members of the medical fraternity, and gained state-wide recognition for his ability as both a physician and surgeon.

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). 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 October will be as follows: October 4th—"Heart Murmurs." October 11th—"Dermatitis and Cosmetics." October 18th—"Food Magic." October 25th—"Forerunners of Cancer."

Members of the Stearns-Benton and Upper Mississippi Medical Societies, with all medical men from surrounding districts as invited guests, will hold their annual joint meeting at the St. Cloud Hospital, Thursday, Oct. 12. The meeting will begin with a tour of the hospital at

5 p. m. Dinner is scheduled at the hospital at 6:30 p. m., to be followed by a scientific meeting in the evening. Among the speakers will be Drs. N. O. Pearce, Minneapolis, president of the State Association, T. A. Meyerding, St. Paul, secretary, and M. S. Henderson, Rochester. The council of the State Society will hold a meeting at the hospital at 2:30 p. m. preceding the meeting. Council members and state officers will be present at the meeting to participate in discussion. Members are urged to bring non-member physicians to the meeting.

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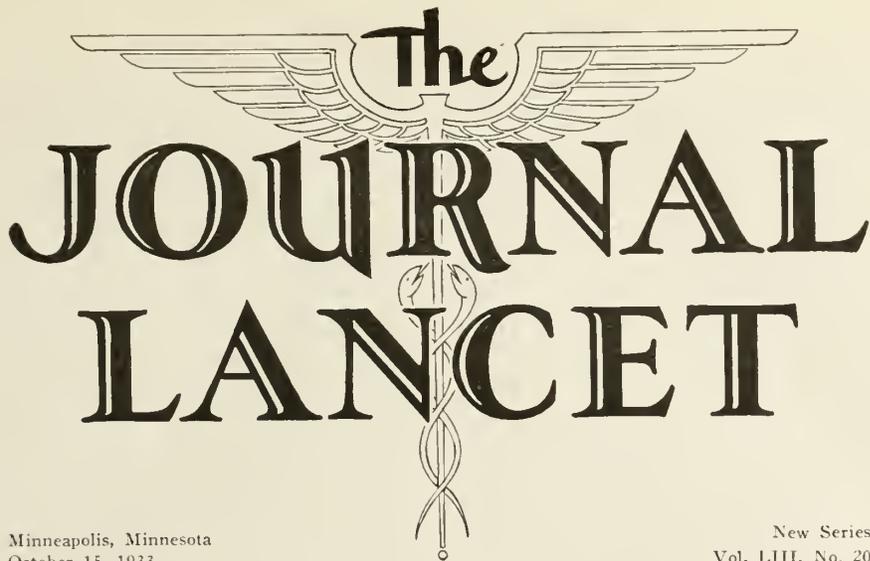
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The
JOURNAL
LANCET

Minneapolis, Minnesota
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Some Practical Points in the Diagnosis and Treatment of Asthma*

Charles K. Maytum, M.D.†
Rochester, Minn.

ALTHOUGH asthma has been known and described since the time of Hippocrates, present knowledge of allergy has been developed entirely within the last twenty-five years. A great deal of experimental and clinical work has been done in that time, yet the exact nature and the fundamentals of allergy are still not well understood. This lack of knowledge and the existing differences in opinion have resulted in a certain amount of confusion in the minds of physicians who have not made a special study of allergy. Since the literature on allergy deals largely with problems in specific sensitivity, I shall try to point out a few of the less emphasized etiologic factors which I believe to be extremely important in the production of asthmatic attacks.

I should like to emphasize that relief of asthma is seldom easily effected, that it requires much time and patience, and that certain patients fail to respond to treatment even when prescribed by the allergist. It obviously is impossible for the physician who sees only an occasional patient with allergy, to keep on hand the materials required for extensive skin testing. In many cases the patient, for financial and other reasons, is unable to undergo a complete allergic investigation. In spite of this, I believe that any physician, by careful observation and investigation, can do a great deal toward relieving the average asthmatic patient.

Since there is no universal cause of asthma, each patient constitutes an individual problem and there is no short-cut to finding the exciting causes. In order to evaluate the various factors which must be considered, an understanding of the etiology is necessary. With this in mind, I have attempted to review present knowledge of the etiology of asthma.

In the first place, asthma is only a local manifestation of a generalized abnormality. This abnormality consists of unusual sensitiveness to various types of stimulation, both specific and non-specific, which are harmless to the normal person. It is known that heredity is the most important etiologic factor, yet the exact nature of the inheritance is not known. Since this inherited tendency cannot be removed, the exciting factors must be removed and, if this can be done, the patient remains free from symptoms and, practically speaking, is cured. The word "cure," however, should not be used, and this should be emphasized to the patient since he must be constantly on guard to avoid the agents which precipitate his attacks.

The allergic patient might be compared to a loaded gun with many triggers. How to unload the gun is not known, but a great deal can be done to prevent its accidental discharge. Multiple exciting agents, or triggers, are important in all cases, although the importance of each may vary with individual cases. Those exciting agents are classified in table 1.

*Read before the South Dakota State Medical Association, Huron, S. D., May 17, 1933.

†Division of Medicine, The Mayo Clinic.

After the diagnosis of asthma has been made, the relative importance of each type of exciting agent in the production of attacks must be determined. A careful history is by far the most important aid to diagnosis, and careful questioning is necessary to bring out the essential facts. In investigating the case of asthma the time spent in obtaining a careful history will pay larger dividends than any other single diagnostic procedure.

The question of specific hypersensitiveness should be considered first. Since I wish at this time to emphasize particularly non-specific etiologic factors, I shall review briefly a few of the many points having to do with hypersensitiveness.

The frequency of sensitization varies with the age of onset of symptoms; the earlier in life that asthma appears, the more likely is the patient to be hypersensitive, and asthma which appears after the age of forty-five years is seldom the result of specific hypersensitiveness. In cases in which hypersensitiveness does exist, the patient is usually sensitive to those substances to which he is most exposed; pollens are the most important, animal danders and feathers next, and foods least. The value of skin tests varies in about the same ratio; that is, tests with pollens are the most reliable, animal danders and feathers next, and, at the Mayo Clinic tests for food hypersensitiveness, disappointing. Many dietary restrictions have been imposed, yet comparatively few patients are relieved by such measures. One important point to remember, however, is that a large meal, by entirely mechanical means, may be responsible for attacks, and that meals, particularly the evening meal, should be small.

About 60 per cent of our patients with asthma give positive tests, and about half of the positive tests are to pollens. This is important because in cases in which seasonal asthma due to pollens is present and in those in which definite exacerbations develop during the pollen season, pre-seasonal treatment with pollen extracts is of great value. One must remember that a positive test does not mean that the reacting substance is responsible for symptoms, and the interpretation of tests requires a careful history and often a period of observation to note the effect of exposure to or of avoidance of the substance in question. For example, one frequently sees patients with non-seasonal asthma who give positive tests with pollen. Results with specific treatment in these cases are likely to be disappointing. Sensitiveness often diminishes with time, and a specific substance may no longer

cause symptoms, yet the test may remain positive. This is particularly true of hypersensitiveness of children to food. Also, patients are seen who formerly had attacks only during the ragweed season, but when they come to the allergist have no increase in symptoms at that time and their asthma has become non-seasonal. Their tests for sensitivity to ragweed, however, remain positive. In cases of asthma of long standing, it is not often that sensitization can be proved to be the only etiologic factor. In these cases the non-specific excitants are more important, as a rule, than the specific excitant, even though skin tests may be positive. Occasionally, a patient may be definitely sensitive to a given substance and yet have a negative skin reaction to it. For these reasons, neither positive nor negative skin tests can be taken at their face value; careful correlation with the patient's symptoms is necessary.

I think it is entirely practical, and very much worth while, for the physician who is interested in asthma to keep on hand for skin testing, from fifteen to twenty-five of the more commonly inhaled offending substances. These should include at least the more common pollens for the locality, the common animal danders, feathers, and orris root. Skin tests, however, would be considered as only an aid to diagnosis, and it should be remembered that testing without careful interpretation and correlation with the history may lead to more confusion than assistance in a given case.

It is possible to determine whether symptoms are due to inhaled substances by placing the patient in a dust-free room. Various commercial air-filters are available by means of which a room can be made practically free from dust and other air-borne substances. A fairly efficient dust-free room can be made by removing all non-essential articles of furniture, decorations, clothing and so forth. The floors should be of bare wood or covered with linoleum, and thoroughly cleansed with a damp cloth each day. It is better that no rug be used, although a small, washable rug might be permissible. The mattress and pillows should be covered with some impervious material, or a canvas cot and an air pillow should be used. The doors and windows should be closed at all times; enough ventilation will be obtained around them. Such a room, kept entirely free from drafts, becomes practically dust-free, since dust settles rapidly in still air. It often is advisable for patients known to be sensitive to air-borne substances to sleep in such a room at all times.

Infection is important in the production of attacks in all cases of asthma and, when asthma

develops after middle age, infection usually precipitates it. Patients known to be sensitive frequently have attacks following acute colds, and patients who are only mildly sensitive to air-borne substances may become markedly sensitive during the time they suffer from colds. The exact method by which infection produces attacks of asthma is not known. There seem to be four possible modes of action: (1) a specific hypersensitiveness to bacteria or bacterial products; (2) local irritation of the respiratory passages; (3) Increased permeability of the mucus membrane to air-borne substances, and (4) decrease in the patient's general resistance. Asthma due to infection is most likely to occur during the season when colds are prevalent, that is, during the winter months. Not infrequently patients state that their asthma occurs in the autumn and spring and often the question of pollen asthma arises. Careful questioning, however, brings out the fact that the attacks occur in the late autumn and early spring, during changeable weather, and are the result of infection. Distant foci are seldom the primary cause of asthma. Chronic infection of the paranasal sinuses may be a factor in some cases; yet complete relief of asthma following eradication of this infection is seen only occasionally. This may be explained by the fact that chronic infection of sinuses is often secondary to the allergic condition rather than the cause of it. A good rule to follow is not to advise nasal operation for a patient with asthma, if such an operation would not be advised for a patient who did not have asthma.

Vaccine therapy often is beneficial in these cases. Theoretically, an autogenous vaccine should give the best result, but since there is no one specific organism for asthma, a stock vaccine seems to give as good results in most cases. In fact, not infrequently good results are obtained from stock vaccine when autogenous vaccine has failed to give relief.

Exertion of any kind, such as fast walking, climbing stairs, coughing, sneezing, and even laughing may set off a paroxysm of asthma. In the presence of asthma of long standing, and particularly in cases in which asthma is on a basis of bronchitis, cough may be one of the important excitants of attacks. The average patient attributes his difficulty in breathing to the accumulation of mucus in respiratory passages and this is emphasized by the rather profuse expectoration which so often follows an attack. Therefore, he usually makes a voluntary effort to cough hard enough to bring up this

mucus. Both patient and physician, however, note that cough during the attacks is ineffectual and the mucus which is raised is in small globules and extremely tenacious. In fact, paroxysms of cough, instead of relieving the attack, actually increase the dyspnea and prolong the attack.

It should be explained to the patient that asthmatic dyspnea apparently results largely from bronchial spasm and edema of the mucous membrane; the mucus as a rule is only a small factor. The irritation caused by coughing increases both spasm and edema. As the attack subsides, with relaxation of spasm, the engorged mucosa pours out mucus, which is easily raised, and the attack is over. Expectoration of mucus continues for some little time after the attack. It should be explained to the patient that voluntary control of cough will not only lessen the severity of attacks, but may often entirely abort the attack. It also is important to emphasize to the patient that excessive coughing tends to aggravate the bronchitis which is already present, and thus a vicious cycle is produced. It is surprising how much relief can be obtained in certain cases by explaining to the patient the mechanism of an attack and insisting that he control his cough just as much as he possibly can. Although most patients will say that control is impossible, a few attempts are enough to demonstrate its value to them. We now have had at the clinic a fairly large series of patients, not relieved by other measures, who either have been relieved or greatly improved by voluntary control of cough. Drugs such as codeine are often of value in allaying irritation and making it easier for the patient when he first attempts to control his cough.

Other substances that cause mechanical irritation should also be avoided as much as possible. These include irritating fumes of chemicals used in paint, also perfumes, smoke, coal gas, and odors of cooking.

Another common fallacy is the patient's impression that it is of benefit to sit or stand before an open window or be fanned during the attack. Cold air definitely increases spasm not only by irritation of the mucous membrane when inhaled, but also by chilling the skin. Since the patient usually is perspiring freely, he should be kept warm and away from drafts during attacks, and sleeping in a warm room, free from drafts, often helps to avoid attacks.

Each patient with asthma has a definite threshold of tolerance and, as long as stimulation is kept below tolerance, no attacks occur. Tolerance,

however, is not fixed and may vary greatly from time to time in the same case. When tolerance is decreased, stimulation which is relatively insignificant may precipitate attacks. States of exhaustion and emotional upsets greatly decrease tolerance and not infrequently mild asthma may become severe as the result of fatigue or emotion. This is not difficult to understand when one considers the disturbances in function in other organs, such as alterations in the motility and secretion of the gastro-intestinal tract, with functional dyspepsia, altered cardiac rhythm, paroxysmal tachycardia, palpitation, heart consciousness, and others which may occur in a similar manner without organic disease.

It is not uncommon, in a case in which there are occasional mild attacks of asthma, for severe, constant asthma to develop following a period of overwork or worry, and for the former state of mild asthma to return following correction of the situation. The production of asthma by a fit of anger is perhaps the most striking illustration of the influence of emotion. Fear of death in some cases is marked, particularly among patients who believe or who have been told that the heart is affected. These patients should be assured and reassured that death from asthma is extremely rare and that the heart is not affected by asthma. In these instances it is more necessary than ever to explain the mechanism of the production of attacks, and to emphasize the importance of exhaustion or of emotional influences. Patients often derive great benefit from instruction in the use of epinephrine given hypodermically since this gives them the added assurance that, should they have a severe attack, they have the means at hand to obtain immediate relief. Much time must be spent in going over the situation with the patient, particularly if he has not obtained relief by other measures, and if no specific cause of attacks has been found. It is advisable to discuss with the patient all types of etiologic agents in the production of attacks in order that he may understand the mechanism and avoid unnecessary irritation.

SUMMARY

Since the allergic tendency cannot be removed, the causes of attacks must be found and removed. Each patient constitutes an individual problem and there is no stock remedy for asthma. One should investigate first the question of specific hypersensitiveness and have the patient avoid contact with substances to which he is known to be sensitive. He may require treatment with extracts of the substances that cannot be avoided as, for example, pollen in cases of asthma caused by this substance. In those cases in which no sensitiveness is found, and in those in which the patient is known to be sensitive, but has not been relieved by specific treatment, attention to the nonspecific causes of attacks may result in decided improvement.

Considerable time must be spent in determining the etiologic factors in a given case and much patience must be exercised in explaining the situation. The time spent in going over the seemingly minor details is well worth while. The significance of mechanical irritation and nervous influences in the production of attacks has been emphasized for, in certain cases, they may be the chief causes of attacks. Considerable enthusiasm on the part of the physician and careful co-operation on the part of the patient are necessary, since correction of the situation must be left largely with the patient, and the amount of relief depends chiefly on his understanding the various causes of attacks. The patient should be told that a cure cannot be promised, since, under proper stimulation, attacks will recur.

TABLE 1 EXCITING AGENTS OF ALLERGIC ATTACKS	
Specific excitants	Nonspecific excitants
Inhalants	Infection
Pollens	Mechanical
Animal danders	Thermal
Feathers	Chemical
Dusts	Neurogenic
Molds	Exhaustion states
Miscellaneous	Emotional influences
Ingestants	Habit
Foods	
Drugs	
Bacteria	



Glaucoma—Responsibilities of Early Recognition

Charles Nelson Spratt, M.D.
Minneapolis

PRIMARY glaucoma is said to constitute one percent of all diseases of the eye. This figure is much too low, as it includes only the acute and advanced cases.

There are hundreds and thousands of persons in the middle and late period of life, who have unrecognized glaucoma, or what may be called preglaucoma or incipient glaucoma. The disease is insidious in character and if the diagnosis is made too late, no relief is to be given. Blood-good has said about cancer, "The easier the diagnosis, the worse the prognosis." This is likewise true of glaucoma.

H. Snellen states that Hippocrates recognized the condition as a greenish yellow discoloration of the pupil, with a shallow anterior chamber, and which led to blindness. Glaucoma is generally a disease of the presbyopic eye and is more common in hyperopes. This is to be expected, for as one becomes older, the lens increases in size and firmness, close work becomes more of an effort, the anterior chamber is more shallow, and the iris angle becomes blocked, thus preventing the outflow of fluid. Heinrich Miller, in 1858 described the adhesions of the iris base. The use of miotics to contract the pupil frees the iris block and in many early and acute cases, the pressure is relieved. It has been said, "Glaucoma is pressure and pressure is glaucoma." All the symptoms of glaucoma may, with few exceptions, be explained by the fact of increased tension. The exceptions are those cases of glaucoma simplex in which optic atrophy, narrow field, and blindness are present, with but slight elevation of tension.

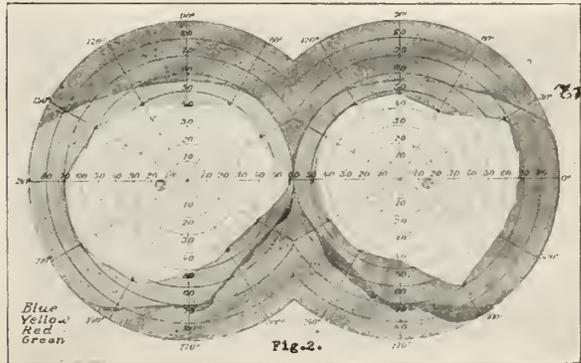
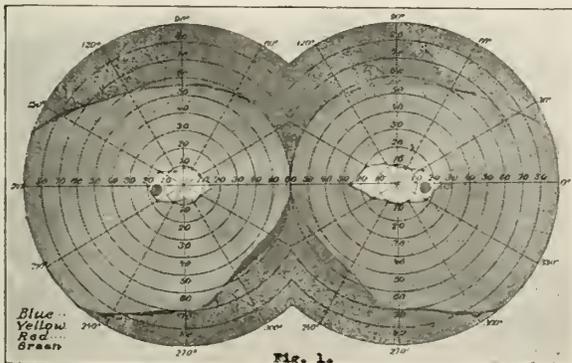
The text book description of the disease, i. e., pain, redness, hard eye, steamy cornea, dilated pupil, cupping at the optic disk, are late stages. If eyes are to be saved and vision is to be maintained, the disease must be recognized before, and not after, the damage is done.

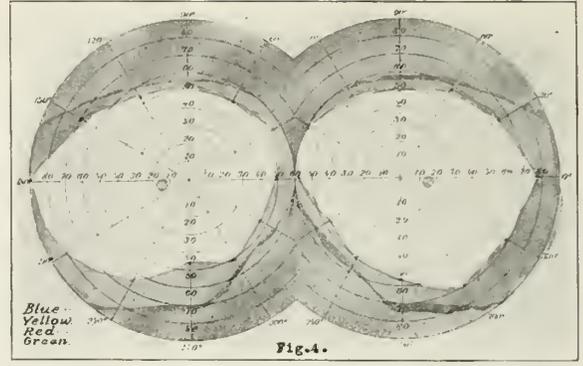
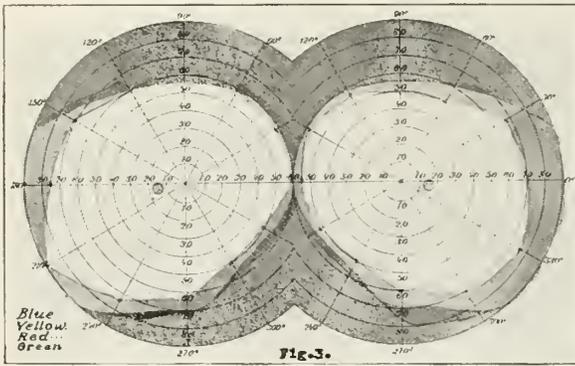
In a recent conversation with Dr. John Green, of St. Louis, he asked the question, "Who is responsible for the tardy recognition of glaucoma? The patient, the optician, the family doctor, the ophthalmologist?" I think that we must admit that each one is guilty of failure to recognize the condition in its early stages.

First. The patient may be ignorant, lacking in perception, or too indolent to notice the diminishing vision, due to the fact that there is no pain or redness. Patients are frequently seen, totally blind in one eye and the second one with reduced vision, who have never consulted anyone about the condition.

Second. The optician sees many of these early cases, but his training and experience is such that he is not to be blamed for his failure to recognize the condition. If the vision is so reduced that he is unable to bring it up to normal, he may refer the patient to the ophthalmologist, or tell him that it is a cataract and when he is blind, operation may give relief. But this is generally too late, the condition ought to be recognized before vision is lost. When a presbyope requires a change in glasses from two to four times a year, even if vision is normal or nearly so, something is wrong with his eyes besides the need for glasses.

Third. The family physician too often has the





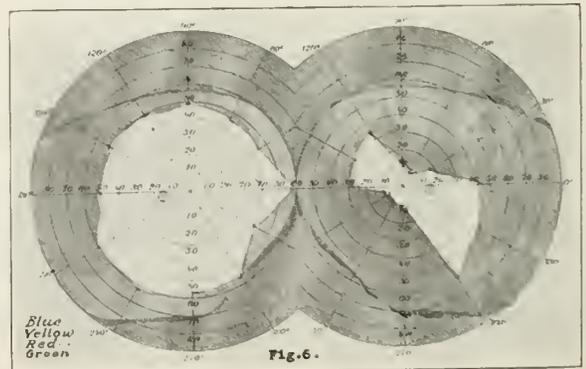
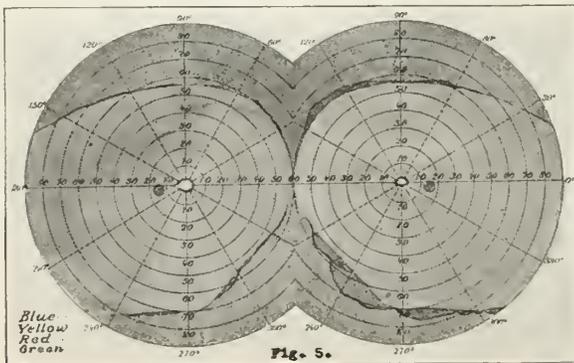
text book picture of glaucoma, pain, redness, hard eye, etc., and not the picture of incipient glaucoma. He may tell the patient that the diminution of vision is due to age, and that the last chapter in Ecclesiastes applies to his condition. Every year, the ophthalmologist sees many elderly patients with failing vision, who have been told that they have a cataract and they must wait until vision is lost before this can be operated upon. Due to the sclerosing or hardening of the nucleus of the lens, the reflex from the eye gives the appearance of cataract. On examination it will be found that these eyes are hard and the patient has glaucoma. In these cases, delay is fatal because when vision is lost it cannot be restored by operation.

Fourth. The ophthalmologist may overlook early cases of glaucoma, unless he is suspicious of every patient over forty-five years of age. He would show good judgment and avoid serious mistakes, if every presbyope had not only the test made for the acuity of vision, but also the tension taken of the eyes with a tonometer, any enlargement of Mariotte's blind spot noted, and the fields determined with a one mm. object at a distance of 1,000 mm. Any suggestion of abnormality in field, tension, or enlargement of the blind spot should lead to retests at frequent intervals. Any patient complaining of night head-

aches, blurring of vision, pain about brow, who requires frequent changes in glasses, has redness about eyes, and shallow anterior chambers, should be carefully examined as these are the early signs of pressure. If the eye is red, hard, painful, pupil dilated, tension high, field narrow, cornea steamy, veins dilated, ciliary congestion, shallow anterior chamber, cupping of disk with green atrophy, and the patient sees rainbows about lights, these are signs and symptoms of an advanced glaucoma, when pressure has existed for some time.

Many cases in old persons are referred to ophthalmologists on account of failing vision. Examination shows a hazy lens by reflected light, due to sclerosis. The intraocular pressure is increased, and we have an early glaucoma due to swelling of the lens causing blocking of the iris angle. The use of one per cent pilocarpine at bedtime will reduce the tension, stop the discomfort, increase the field of vision, give relief of symptoms and prevent an early or incipient glaucoma from causing destruction to the eye. The diagnosis of incipient glaucoma is at times difficult. A presbyope with contraction of the field, a persistent ache at night or after use of eyes, or a blurring of vision, whose glasses need frequent changes, who may or may not show

(Continued on Page 550.)



Occipito Posterior Position*

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BECAUSE of its relative frequency and the often annoying and at times apprehensive course of labor, I have chosen the subject of Occipito Posterior Position to discuss before this meeting. To me it always means more careful observation and treatment if one is to bring about a satisfactory termination of labor. I have in mind the severe lacerations of the mother which often result from improper application of forceps, and the possible cranial hemorrhage in infants from the subjection of the foetal head to prolonged trauma from improper rotation. To quote from a paper of Dr. Bill,¹ "This complication still causes those who practice obstetrics more trouble than any other. By this, of course, I do not mean that it is the most serious complication, but because of the frequency of its occurrence, it is a very common source of annoyance." It is also true that many Occipito Posterior Positions will right themselves spontaneously.

INCIDENCE

Barnes² presented the following: "In regards to its frequency as a primary condition, there is a wide variance of opinion. The percentages given for this position range from 11 per cent in a series in Sloane Hospital, 17 per cent in John Hopkins Hospital, 16.8 per cent in Williams³ series of 1,687 cases which he considers to be low, 25.1 per cent in Danforth's³ series, and to 29 per cent in DeLees⁴ series. Williams⁵ places the frequency of left Occipito Posterior to right Occipito Posterior at 1:5 and Right Occipito Posterior to Right Occipito Anterior to 1:2.

MORTALITY

Persistent Occipito Posterior Position carries with it a high foetal and maternal mortality. In 20,000 cases with 13 per cent persistent Occipito Posterior Positions, Cragin found a foetal mortality of 7.66 per cent, while Hurst places it at more than 9 per cent.

DeLee in his text book states: "For the mother, exhaustion and sepsis from prolonged labor, and the frequently necessary operation, with the almost inevitable lacerations, are to be feared. For

the child, asphyxia, and the operative delivery being more dangerous, more children are lost from this complication than are lost from the effects of contracted pelvis. It might not be amiss here to mention the mechanism of labor in cephalic presentation. There is some dispute as to the entrance of the head into the superior strait or inlet, some authors contending the head enters in the transverse diameter, and others, in one of the oblique diameters. DeLee, however, holds that the head enters in the transverse diameter, and after entrance rotates either to the anterior or posterior position. This rotation is determined by the uterine contraction, the resistance of the pelvic floor, and the degree of flexion of the head.

When there is some abnormality that interferes with the internal rotation of the head, one of the following may result: (a) in the extreme cases it will remain posterior or even rotate into the hollow of the sacrum, (b) if conditions are not too extreme, the occiput will advance to a half way point and come to the transverse arrest position, and finally (c) under the most favorable circumstances the occiput will rotate through an arc of 135 degrees, the head then being born in the anterior position.

ETIOLOGY

A. *Internal Causes.*

1. The most frequent is some minor contraction of the pelvis, such as the flat type with its contraction in the anterior-posterior diameter.

2. The funnel pelvis with its narrow pelvic arch, found so often in the masculine type of female. This type frequently have large, thick chested babies, which also, no doubt, play a large part in delayed rotation.

3. The peculiar type of pains associated with occipito-posterior, which usually are of short duration and a long interval, and result in a marked decrease of uterine tone. As a result there is only partial rotation of the head anteriorly.

4. With early rupture of the membranes, there is an improper filling of the lower uterine segment by the head, and thus an improper

*Read at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1-2, 1933.

†The Medical and Surgical Clinic.

dilatation of the cervix. As a result the cervix at times may become completely effaced, but the dilatation does not progress, and the head does not advance.

One cause alone may not bring about delay of rotation, but a combination of one or more may easily do so.

5. Then there is the multipara with the relaxed perineum and relaxed abdominal muscle producing the pendulous belly, which does not permit a proper engagement and proper rotation of the head.

B. *External Causes.*

1. DeLee mentions prolapse of the arm. This may cause sufficient obstruction to the process of abnormal rotation.

2. Tumors of the uterus, or tumors of the extrauterine pelvic tissues are often found as causative factors.

DIAGNOSIS

The diagnosis of Occipito Posterior can readily be made before delivery. The usual routine of palpation, inspection and finding of foetal tones in the mother's flank suggest the diagnosis. The finding of foetal heart tones to the left and anterior may be confusing, their location in this position being due to extension of the foetal head producing forward arching of the chest wall, with the resulting transmission of the tones through the left lower uterine segment. This may lead to the impression he is dealing with an anterior position, especially where difficulty is found in manual examination, due to increased muscle tone or thickness of the abdominal wall. The patient's own version of the location of the foetal movements often prove valuable. If felt over the entire abdominal wall, it is suggestive of the back being posterior. Seeing foetal movements over the mid-abdomen and to the left, usually a right posterior position.

I know that many of your patients do not present themselves for ante-partum observation and care, your first contact being at the time of active labor. In this instance the position is not known and can only be ascertained by history of onset and progress of labor, and by examination. A history of the membranes rupturing before or at the onset of labor, followed by the typical pains, i. e., the pains of short duration and long interval, should suggest the diagnosis of an Occipito Posterior Position. The progress from this type of pain is slight or nil and only serve to tire and annoy the patient. A rectal or vaginal examination will reveal the presenting part to be high,

or barely engaged. A location of the large or anterior fontanell will confirm the diagnosis. If the patient has been in labor a long time and a large caput has formed, a great deal will depend on the sense of touch and past experience. With little difficulty it is usually possible to locate the posterior ear. Then by passing the finger over the ear and noting its position and direction, the position of the occiput can be ascertained.

TREATMENT

Naturally this will vary according to each case. If the patient is seen in the pre-natal clinic, certain instructions can be given. It is advisable that she rest on the side on which the occiput is situated, at stated intervals throughout the day. If possible she should sleep on her side. DeLee and others hold that this favors anterior rotation. It can also be tried during the first stages of labor. A careful examination of the pelvis should be made to determine the presence or absence of abnormalities, a factor which may be of valuable importance to help one determine his method of delivery at the later date. Personally I try to keep the gain in weight of my patients down to twenty pounds or less during the pregnancy. I cannot say how much this influences the baby's weight, but I do know that a patient over weight having gained thirty to fifty pounds does not stand labor well, and this is especially important in the prolonged exhausting labors one sees with the posterior positions. It is like an athlete going into competition in poor condition.

During active labor, conservation of the patient's strength is always important. Avoid, if possible, early rupture of membranes. The idea of early bearing down and artificial rupture of the membranes to hasten delivery is wrong and serves only to prolong labor. During the first stage, one of the best methods to conserve the patient's strength is to lessen the suffering as much as possible. Morphine, grains one-sixth, or hyoscine grains 1-100, given alone or with morphine, produce the desired rest, and I have found personally, favor softening and dilatation of the cervix. Fluids ad lib are always indicated during the first stage. If progress continues favorably and the occiput descends to the pelvic floor and continues to rotate to the posterior position, all will go well. This progress can be ascertained by rectal examination. At times I have been surprised, and happily so, to have had the head born spontaneously with the face toward the pubis. This favorable event has usually been in a multopara with a relaxed perineum, and a small baby, the

relaxed perineum no doubt being one of the important causative factors.

During the second stage, however, in the cases where the occiput is not rotating and it becomes evident that the head is going to remain in the persistent posterior position, upward pressure on the forehead during a pain may increase flexion, and by so doing favor anterior rotation. For each case, one must decide the most suitable means of attacking the problem, and too much delay must not be allowed after there is complete dilatation and progress has stopped. All authorities are agreed that the second stage permitted to progress too long only adds dangers to the foetus, making it a poorer operative risk, when interference becomes necessary. The ultra conservative non-interference, "let nature take its own course," when nature is no longer able to take any course, should be condemned, and is just as radical as the too early interference before the requirements for version or forceps are fulfilled.

Having decided the occiput has been arrested in its progress and that it is remaining posterior or in transverse arrest, methods of delivery are to be chosen. They are: 1. Caesarian Section. 2. Podalic version. 3. Manual rotation, and, 4. Instrumental rotation. Which one is chosen will naturally depend on surroundings, assistance, personal ability, degree of descent of foetal head, and abnormalities of the maternal pelvis.

Caesarian section is indicated whenever a contracted pelvis or deformities of the soft parts prevent passage of the foetus through the birth canal, all of which should have been diagnosed early, and plans long before completed. Instrumental rotation is indicated by one who is familiar with the method, and brilliant results are often obtained. Dr. Bill has long been an advocate of the Scanzoni maneuver. Personally, Podalic version or normal rotation has been my methods of choice.

In home deliveries, having no convenient place to conduct your operations, difficulties often arise. When the buttocks are brought over to the side of a low bed to apply forceps, the operator is placed in a poor position, and thus it is difficult to apply traction in the proper direction. Often the traction only impinges the head directly against the body of the symphysis. A much better procedure is to make use of the kitchen table, which places the patient at a higher level. The operator is able to be seated, and under such circumstances either version or manual rotation is made much easier.

The indications for terminating the case by podalic version are well covered by the words of Williams:⁵ "When the head is arrested at the superior strait in a posterior position, version should be resorted to as soon as one is convinced that spontaneous advancement will not occur, provided, of course, that the operation is feasible and is not contra-indicated, by disproportion between the size of the head and the size of the pelvis."

PODALIC VERSION

You are all familiar with the technique of version. Following are a few of the things that impressed me after observing Potters technique.

1. Avoid haste at all times.
2. Complete dilatation of cervix and relaxation of uterine muscle by deep anesthesia, Rucker⁵ advised the use of adrenalin to obtain uterine relaxation.
3. Obtain relaxation of the levator ani and vagina by manual dilatation using sterile green soap, introducing one finger of the gloved hand and passing it up as high as the cervix and then withdrawing it with a steady firm pressure. Then the same maneuver with two fingers, three fingers, etc., and finally the closed flat.
4. Rupture the membranes, if still intact and high up, always avoiding the side of attachment of the placenta.
5. If possible, bring down both feet.
6. Deliver both shoulders under the symphysis, the anterior one first.
7. Counteract the extension of the head with the finger of one hand in the child's mouth and with the other make gentle pressure above the pubis.

MANUAL ROTATION

When the head has become engaged and is arrested with no apparent further progress, the head either remaining posterior, or rotating transversely, operative interference again becomes necessary.

Manual rotation of the head is now indicated. The technique remains much the same as advocated by Tarnier (1828-1897). Modern writers suggest the following procedure to follow in retaining the rotated occiput in the anterior position.

RIGHT OCCIPITO POSTERIOR

1. The vagina and soft parts are treated in the manner given under podalic version. The patient is also completely anesthetized.
2. The left hand is introduced, grasping the occiput, the finger tips touching the right side of the foetal head. The external right hand tries to

locate the left shoulder in the mother's right lower flank. Pressure on the anterior chest may also be used, stroking the anterior shoulder to the left.

3. With a combined movement the occiput and body are rotated into the anterior pelvic quadrant. The difficulty is to rotate the shoulder and body. If this is not done the withdrawal of the "vaginal hand" results in the return of the occiput to the posterior position. At this stage DeLee advocates the grasping of the occiput with a vulsellum until forceps can be applied. This suggestion has not met with general favor. The application of the forceps before withdrawal of the "vaginal hand" will avoid the return of the occiput to the posterior position. To quote from Barnes:⁷ "The left hand, having rotated the head, is kept in place to hold it and to guide the right blade to the right side of the foetal head. The latter applied, effectually holds the head in the corrected position. The left blade is then easily introduced and while the process of locking is a little awkward, yet it is readily done by shifting and manipulating the handles. For a left occipito posterior, the external manipulations are reversed. The above technique has been my method of choice.

Danforth⁸ advocates introducing the right hand and rotating the foetal head, until the occiput has just passed the median line. The right hand is now in the position for the usual application of forceps. The left blade is introduced first, and by exerting pressure laterally against the child's face backward rotation is prevented.

I have reviewed a series of 1,170 consecutive cases delivered by me from January 1, 1929, to December 31, 1932. These cases were delivered in St. John's Hospital, Fargo, N. Dak. A routine check is made upon the delivered head and the position is verified. In the 1,170 cases, 216 were diagnosed as posterior positions, and incidence of 19.3 per cent.

The following statistics deal with 216 posterior positions:

		%
Primiparas	130	60.2
Multiparas	86	39.8
Labor at Term	192	88.8
Labor Premature	24	11
L. O. P.	17	8
R. O. P.	64	29.6
R. O. P. to R. O. A.	61	28.2
L. O. P. to L. O. A.	74	34.2
Transverse Arrest	23	10.6
Corrected Manually	39	17.6
Delivered P. P.	42	19.4
Delivered Spontaneously	130	60.2
Mid—31		
High—1		
Forceps—Low—39		
After coming		
head—1	72	33.3

Versions	8	3.2
Cesarean Section	6	2.8
B. O. W. Before Onset of Labor	31	14
Hemorrhage Following Delivery	14	6.5
Hemorrhage Before Delivery	14	6.5
Episiotomy	71	32
1 Degree Laceration	20	9
2 Degree Laceration	60	28
3 Degree Laceration	2	.9
No Laceration	52	24
Vaginal Tears	10	5
Cervical Tears	27	12.5
Morbidity 100F	38	18
Phlebitis	4	1.8
Bronchitis	9	4.17
Pyelitis	1	.5
Septicemia	0	
Grippe	2	.9
Breast Abscess	6	2.8
P. O. Reaction After Cesarean Section	2	.9
Cystitis	2	.9
Catarrhal Jaundice Following Delivery	3	1.4
Enteritis	1	.5
Diabetes	2	.9
Pre-eclamptic	15	6.9
Subinvolution	24	11
Pelvic Anomalies	65	30.1
Flat	12	5.5
Pumpel	27	12.5
Moderately Contracted	17	7.9
Definitely Contracted	3	1.4
Deformed	3	1.4
Pelvic Tumors	2	.9
Injured	1	.5
Uncorrected Infant Mortality	5	2.3
Corrected Infant Mortality	3	1.4
Maternal Mortality	0	
Girls	92	43
Boys	124	57
Baby Died Following Delivery	2	
Baby Stillborn	3	
		Average
Days in Hospital	12½	Hours
1st Stage	8½	Hours
2nd Stage	3½	Hours
Longest 1st Stage	37	Hours
Shortest 1st Stage	5	Hours
Longest 2nd Stage	6	Hours
Shortest 2nd Stage	1	Hour

DISCUSSION ON PAPER OF DR. HANNA

DR. J. L. CONRAD, Jamestown: I am glad to hear Dr. Hanna's paper and to learn that he takes a middle ground between those who want to interfere too soon and those who trust nature too far. Probably one group does as much harm as the other. Where the baby is to be delivered in the home one might be inclined to give the mother a little more time, especially for taking them through the first stage, so that they come to the second stage in good physical condition, and then by the use of a good abdominal binder, by teaching the mother how to bear down and to work well with each pain you will often have a satisfactory termination. However, if in the home you have someone who can give a good anesthetic, so that you can get good relaxation, you probably are justified in interfering as early as you would if the patient were in a hospital.

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“Looking Backward” By an Old Country Doctor

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Britton, S. D.

The science of medicine comes as a boon and a blessing to mankind.

It bears a beam of the “Divine Light” to shed its rays on poor humanity. It makes our present civilization possible.

At the same time the science of medicine is a great futility. Like a dam across the river, it resists the current for a while but the river still flows on to the sea.

It encourages the survival of the unfit and disturbs the balance of creation in many ways.

If we could go back four or more decades and have the state of medical education and the conditions of medical practice generally set before our eyes, we would behold many strange things. If we should compare the state of medical education of that time with what it is today we would marvel still more.

In those days medical colleges were very numerous. They were independent institutions which subsisted altogether on the fees paid by the students. This led to a keen rivalry among the schools to see which could get the most students and therefore the most money.

Various inducements were held out to the prospective students. These took the shape of promises, either definite or implied, as to how easily he could get through or how sure he was to pass in spite of a neglected education.

The time required to make a finished physician was three years of five months each, one year of which could be taken under a preceptor. The instruction consisted of courses of lectures given in the forenoon. These lectures were attended by the student body at their own pleasure, and no roll was called and no record was kept of the student's progress. At the lectures many of the students took notes but others sat and regarded the lecturer with looks of vacant curiosity. We must not jump at the conclusion that these lectures were all of an inferior quality. Not at all. Some of them were very good and given by clever fellows.

As the program for the afternoon consisted of clinics, held irregularly two or three times a week, and as there was no compulsory attendance at anything, the saloons in the neighborhood of the college were filled with earnest students.

To those who love paradox, let it be known that out of this state of affairs arose eminent medical men—surgeons of renown, and men who could hold their own in any field of medical controversy. In fact it was this generation that produced the men who put American medicine and surgery in the front rank.

At that time the development of the West was still in progress. New towns and villages were springing up every day, all calling for resident doctors. Hence the graduate of that era was sure of a livelihood—such as it was. There was a big demand for general practitioners, a demand which does not exist today.

The young doctor of that day had much to contend with, due to his meager medical education. Hospitals were few and internships were hard to obtain. He had to practice country obstetrics with insufficient training and without assistance; but these things made him self-reliant and resourceful. Also about the time of which we write, many excellent text books began to make their appearance. If our doctor had a little intellectual equipment of his own, he could improve himself and acquire the skill of study as distinguished from the skill of experience. Due to the constant effort of many of these country doctors to improve themselves, the medical service in the country was not so bad.

The general practitioner of that time was inclined to affect a distinctive dress. It was not a uniform but rather a means of self-expression. He wore a long black frock coat, and some times a silk hat, and usually he had a van Dyke beard. Since it was not a uniform it is difficult to describe the variations of the doctor's dress. He often wore a white tie, and as this item was also affected by gamblers and preachers, a man who wore a white tie was regarded as either awfully bad or awfully good by the people. This dress when worn by young men, was not got up so much from vanity as it was to impress the laity that he was mature enough to assume the serious responsibilities of his profession.

The doctor of the last generation got along famously with his public. The people adored him; they set a halo on his head and glorified him. Writers wove him into story and romance.

Much has been made of the hospitality of the community towards him. He could eat at the honest farmer's table and stay all night if he wanted to. This no doubt added a glow of pleasure to the drudgery of his existence. But these joys vanished when a new younger doctor came to dispute the field with the older man. Then human nature asserted itself and his patients deserted him in a body, unmindful of the sacrifices he had made for them. The Old Doctor discovered that the gratitude of patients was a myth; that many of them never paid him; but this made a philosopher out of him.

Among his many amiable qualities this Old Doctor had some animosities. He hated and feared homeopaths. Homeopathy, once a powerful cult, was greatly encouraged by the people. They recognized it and gave it equal rights and privileges with the regular medical profession. They spoke about the "two schools of medicine." Time proved homeopathy to be a ghost that appeared in the darkness of ignorance, and in the light of science it became invisible. At that time the art of medicine did not have so much scientific foundation to stand on as it has today. When science began to wax, homeopathy began to wane, until now it has almost disappeared. But homeopathy was able to haunt the Old Doctor's pillow for many a year.

Today we have the chiropractors and the osteopaths, both eager to join battle with us, because they know that quarreling with us will give them importance, and also the advertising that they like so well. They know that our resistance is necessary for their growth.

The menace of a cult is not in the patients they deprive us of. They are welcome to these. Our solicitude for the public's welfare is largely hypocrisy anyway. But there is time for lamenting when by our resistance we elevate them to the status of M. D.'s; or when in a weak-minded way, we admit them into fellowship or let them qualify for our profession on any pretext whatever. Then we lower the dignity of the medical profession and inflict an injury on our ethical side which is deep and lasting. If we could be induced to leave the cult alone and adopt as a maxim, "Kick no sleeping dogs," we could then leave the cult to the police—if it got too strong—and attend to our own business.

Our friends, the people, will see to it that the cult receives all the encouragement it needs, and that they are capable of giving it. When a cult dies another cult springs up to take its place. We

need not fear the cult, because the seeds of its own destruction are in every cult at its birth. Cults will come and cults will go to the end of time. Credulity is an infirmity in human nature that requires a cult or its equivalent to satisfy it. On this ground the cult has as much right to existence as we have, and we should be smart enough to recognize it as a passing shadow.

Human nature is no doubt as it was intended to be. It is unchanged and unchangeable. There is much that is sordid and a little that is noble in it. The medical practitioner seems to have plenty to do with the sordid side.

But we depend on the people for our sustenance; and it behooves us to get along with them some way or other, because they certainly do not have to get along with us. We are apt to overestimate their intelligence when it comes to educating them. Our efforts at educating them have been disappointing. They never will be anything else.

The people have not been so thrilled at the advance of medical science as we hoped they would be. They have been more impressed by the obvious achievements of electrical and mechanical science, aviation, etc., than by the test-tube and guinea pig experiments of medicine, which are not so obvious.

The Old Doctor got along very well with the people until the automobile destroyed his background. This brought him into contempt, and he fell from his former high place in the esteem of the people. If the automobile destroyed his background for him, at the same time it took the drudgery out of his calling. It is strange that the doctor should thus lose his prestige. For when he did not know so much they made much of him and paid him fulsome flattery, but now when he has found out a little more about his business, they do not find him so interesting.

So much has been said of late about the dearth of doctors in the rural districts that it deserves a little intelligent inquiry. So many reasons have been offered to explain it that some of these reasons should be examined. One of the reasons that is generally accepted is that the Young Doctor who is being turned out today is so scientific that he cannot practice without a laboratory at his elbow. If this reason is true, then medical education has missed its mark.

When a Young Doctor takes science too seriously or gets brooding over it, then he does not possess the qualities necessary to make a general

(Continued on Page 546.)

The Doctor and the Workmen's Compensation Bureau*

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THE Workmen's Compensation laws differ in the different states and are either compulsory or elective. We, in North Dakota, have a compulsory law, and every employer must carry insurance to protect his employees. Agriculture, domestic service and casual employment only being excluded.

The North Dakota law is one of the most effective among the different states of the union, and is second only to that of the state of New York in the specific benefits paid to injured employees. The annual sum paid out is approximately half a million dollars. In 1930 the compensation paid amounted to over \$556,000.00, of which 27 per cent was expended for medical and hospital fees. Disabled employees receive a weekly compensation amounting to two-thirds of their weekly earnings, but this compensation shall not exceed \$20.00 per week. This amount is paid during the entire period of his inability to work and is called "temporary total" disability. When an employee is not totally disabled but can do part of his work or some other kind of work, he is entitled to the benefits depending on his earning capacity.

In addition to payment for temporary disability, compensation is also paid for permanent disability representing, as it does, a defect or handicap that will tend to lessen the earning power of the injured individual and which presumably will remain for life. Permanent disability may be total or partial, same as temporary disability. The responsibility for the appraisal of the degree of temporary or permanent impairment occasioned by a specific injury rests upon the medical profession.

All the countries have been slow to adopt the inclusion of occupational diseases in their acts. The British were the first people to include a special list of occupational diseases in 1906. This was followed later by similar legislation in other countries, which, however, limited the number of industrial diseases.

The most common of these are lead, mercury and benzol poisoning and anthrax. England has since gone farther and has increased its

*Read at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1-2, 1933.

original list to thirty. Our law does not specify any particular diseases, but reads as follows: "The term 'injury' includes in addition to any injury by accident, any disease proximately caused by the employment." You can readily see that this paragraph opens up a vast field of possibilities, and the bureau is confronted by the problem of determining liability which is, at times, extremely difficult.

Attention has been directed to this problem through the frequent claims that are made of the initiation or aggravation of disease in injured workmen. We can easily understand why workmen ascribe the onset of disease to certain events which occur in their daily work, because it is almost impossible for a man to go through his routine work day after day without experiencing many trivial traumata. The untrained laymen, therefore, find it easy to connect these trivial traumata with the onset of symptoms that arise from other causes.

Just as the layman or workman has a tendency to ascribe a disease to a possible accident at work, so is the attending physician inclined to follow the same kind of reasoning, using the sequence of events as the basis for his proof rather than an exact study of the cause of the disease, and the injury alleged to be responsible for it.

The general tendency in compensation practice to give the injured man the benefit of the doubt is reprehensible in that the traumatic cause of the disease is usually based on possibilities. The relation should be highly probable, and not merely possible. Courts of law have frequently taken upon themselves the task of establishing this relation, and while the decisions are examples of fine logic, the majority are at variance with accepted medical facts.

Let me give you an illustration: A young man of 20, weighing approximately 200 pounds was working in a plate glass establishment. His duties were those of moving plates of glass about, loading and unloading them. He made claim for broken arches, the result of heavy lifting over a period of several months. The claim was dismissed and suit was filed

against the Bureau. The evidence in court showed that the claimant was able to walk all day out hunting, but insisted that he was unable to work. The court awarded the claimant 90 per cent permanent partial disability. The examination showed a second degree flatfoot, which everyone knows is not disabling and which unquestionably existed long before he handled glass plate.

An equitable system of arbitrating claims for injury arising out of employment must be based on exact medical information in order to warrant compensation for the same.

One of the difficulties we have to overcome is the claim of the petitioner that up to a certain day he was entirely well, free from pain and symptoms, and that following some incident or accident on that day symptoms developed. Awards are frequently made on the basis of the absence of previous symptoms, the relation between injury and disease being established on the premise that the absence of symptoms presupposes a normal healthy individual. This supposition has been frequently disproven by the records of entrance examinations of recruits for the World War, by industrial records of examination at the time of hiring, by institutions that make a practice of periodic examinations as well as by autopsy reports.

Into this group can be placed the alleged back injuries, which, in the last few years, have composed by far the largest percentage of compensation claims in North Dakota. The subject has attracted universal attention to such an extent that the program committee for the next meeting of the National Industrial Association in Chicago in September have decided to devote practically the entire meeting to a discussion of "Back Pain."

The spine is the point of selection for osteoarthritis. Changes here are rarely found under 20 years of age unless there is a history of acute trauma. A localized trauma of the spine producing a fracture of a vertebra may be followed by the outgrowth of neophytes, not only on the injured vertebra, but also on the adjacent vertebrae, which apparently were not severely traumatized. It stands to reason that these cases are compensable, many of them carrying a permanent disability for which the Bureau is liable. When, however, an individual suffers a back injury, of a less serious nature, and there is present a preexisting osteoarthritis which becomes aggravated, the

Bureau can be held liable only for the acute exacerbation.

Allard, in 2,000 X-rays of the spine taken at the Mayo Clinic chiefly for the study of the urinary tract, found osteoarthritis of the lumbar spine in 67 per cent in men past 50 years, and in 40 per cent in women.

Chronic arthritis is one of the great problems that we have to deal with in connection with industrial insurance. A study of workers has shown that the man who works in a stooping posture over a period of time develops neophytes on the spine. One who presses a pedal with his foot develops osteoarthritis of this extremity, while the man who must frequently reach up to pull a lever, or one who constantly uses his arm such as a baseball pitcher, develops osteophytes in the elbow or shoulder.

The records of autopsies can never be overestimated. Two years ago a man, together with several others, was loading a handcar onto a platform. The car slipped back and in order to hold it, the man received a sudden jerk in the back which immediately disabled him. The pain was confined to the right sacroiliac area. He was treated by a chiropractor over a period of four weeks. Not getting any relief he changed to a medical man. At that time he had no fever, but complained also of pain in the right lower abdomen. This continued for several weeks longer when a mass was felt in the region of the appendix. There was also a rise of temperature and a marked leucocytosis. A diagnosis of appendiceal abscess was made and the abdomen opened. There was found a retrocecal abscess, which apparently confirmed the diagnosis. The man died and the claim for compensation was dismissed, because no direct relation could be established between the injury and the disease, causing death. Suit was filed against the Bureau and the latter ordered an autopsy. This showed a normal appendix. The abscess had originated between the iliacus and psoas magnus muscles, was extraperitoneal and undoubtedly the result of a degenerated, blood infected hematoma in the iliacus muscle, caused by the sudden strain. The Bureau was thereupon held liable and, of course, paid the claim.

A direct and severe contusion of the abdomen in rare cases may injure a sound and healthy appendix and initiate appendicitis, whereas a physical exertion such as a lifting effort, according to authorities, cannot be a

cause. Most cases occurring in industry are due to aggravation of preexisting appendicitis through direct or indirect force. Heavy lifting or exertion may aggravate the condition when there are adhesions present, or may rupture an abscess which existed before the insult. The proof of the initiation or aggravation of an appendicitis as the result of accident rests on the following postulates:

1. No symptoms or signs of appendicitis should have existed before the injury and the individual must have been able to work.
2. Severe injury of the abdomen or a real over-exertion must be proved.
3. Severe evidence of illness must be proved at once which leads to immediate cessation of work. An interval of two or three days without any symptoms and with full ability to work makes the asserted relation improbable.

No case of alleged appendicitis should be compensable unless it is operated upon since a diagnosis would be too vague and uncertain without operation.

Traumatic pneumonia is scarce, and Frenkel claims that not over two per cent of the cases are due to direct influence of an accident. It is admitted that pneumonia may result after an injury to the lung, which causes a lowered resistance of the tissue, permitting the pneumococcus which is always present in the respiratory tract, to thrive and multiply and thus cause the onset of pneumonia.

Attention should be given to the nature of the trauma, but this is of less importance than the mode of onset. In order to establish the relation, it is necessary that the individual should have sustained a severe crushing injury or contusion of the chest. The following types of injury may also be considered as adequate cause of pneumonia: Severe exposure of body to cold or wet, inhalation of poisonous gasses or dust, or aspiration of foreign bodies, etc., but it is generally agreed that the pneumonia must occur within three or four days after the chest injury to be considered of traumatic origin. If the pneumonia occurs later than the above number of days, bridging symptoms such as a cough, fever, and expectoration must be present, in order to connect the disease and the injury.

The treatment of fractures has not yet reached the stage of standardization, but enough is known about the general principles involved to lay a basis for adequate and

ample care. Sufficient time must be allowed for the bone to heal, but this period must not be so far exceeded that through protracted immobilization it produces stiff joints, atrophied muscles and neurotrophic disturbances.

The end results obtained in fractures following industrial accidents, in the experience of the compensation bureaus of this country, have been far from satisfactory. A very large percentage of cases that are presented as end results and come up for adjustment of compensation require further reconstructive treatment. The poorest results, as a whole, are obtained in simple fractures about the wrist- and ankle-joints. What are the specific factors responsible for these poor end results?

1. Lack of training and ability.
2. Lack of proper facilities such as X-ray to determine the exact condition. Today there is no excuse whatever in denying a patient a radiograph. We advocate the taking of X-rays in all cases of fracture or where there is a question of doubt.
3. Lack of treatment following incorrect diagnosis.

Since the adoption of thorough secondary treatment, the period of disability following a fracture has been considerably reduced. When the fracture is located at or near a joint, gentle passive motion, manipulation and massage should be resorted to within one or two weeks and by the time the fracture has healed, the function of the joint is totally or in part restored and the disability period shortened to a considerable degree. A patient can no longer be dismissed after a Colles' fracture as soon as the splints are removed with the simple admonition to use the limb as much as possible.

Just a few words about traumatic neuroses. To define the exact causation of the neuroses in general would be equivalent to solving the riddles of human behavior. We know the reaction of the human mind to certain stimuli, but cannot explain the reason for it. From a large experience it has been found that accidents are followed by nervous symptoms in a certain percentage of cases. What are these symptoms due to? In one case there may be a severe injury, a fracture of the spine; in another, there may be only a scratch or a slight burn; in still others there may be no physical injury. The introduction of workmen's compensation in this country, as in

other countries, was followed by a large number of neuroses.

In establishing the origin of a neurosis, which is said to have followed an injury, it is important to determine, in so far as it is possible, whether the neurosis existed previous to the accident, whether it resulted from the accident or from some other cause subsequent to the accident.

The traumatic origin of the neurosis should be conceded, according to Llewellyn:

1. If no intercurrent affection, no antecedent or subsequent injury explains its genesis more plausibly.
2. If symptoms, headaches, dizziness, insomnia, etc., manifest themselves in the period between the accident and the onset of the neurosis.
3. If the principal nerve symptoms are localized at the site of the injury.
4. If the trauma involves shock or concussion.
5. If the injury produces some painful lesion or state which furnishes a basis for the development of the hypochondriacal mental attitude. In some of the milder cases such an outline helps to determine the etiology, but is too arbitrary for the large run of cases.

It is very essential that we make a definite diagnosis between traumatic neurosis and faking, or compensationitis, as it has been called.

During these times of depression people try to hang on to their compensation as long as they can. Many of our claimants lay off month after month apparently entirely recovered from their injuries. Upon inquiry we get the information that, "My doctor told me not to go to work yet" or "My doctor told me I would have trouble for a long time and I might never get over it." Such a statement by a doctor is deplorable and cannot help but make an impression on the minds of the plaintive or sensitive type or the hypochondriacal.

Let me relate the history of a very interesting case which very well illustrates this point: A man of 40 years of age was moving a flower box in a green house. The box slid against his chest causing very slight discomfort. The claimant worked several hours after that, in fact until 6 P. M. During the afternoon he pulled a small stake out of the ground and claimed the exertion had hurt his chest where the flower box had bumped against

him. Two days later he went to bed claiming inability to work. The doctor in his preliminary report stated that the claimant had an osteomyelitis of the costal arch. He was treated for this over a period of several months when the doctor reported complications in the form of a spinal sclerosis with paralysis of the left leg. Claimant was sent for and examination revealed no pathology of the costal arch. The paralysis disappeared completely in two weeks. But when claimant was advised that he would be sent home he promptly got worse. The interesting feature of this case was that claimant insists his doctor told him two weeks after his alleged injury that he could relieve him of the pain in the chest, but that he would have paralysis of his leg after the pain in the chest subsided. Here we deal with a receptive mind which was ready to react to the stimulus of suggestion.

If these phases of the problem were known to physicians in general, and if the psychiatric cases were treated competently directly after accident and subsequently, the development of many cases of traumatic neurosis could be prevented.

"LOOKING BACKWARD"
BY AN OLD COUNTRY DOCTOR
(Continued from Page 542.)

practitioner. We have all seen the ultra-scientific gentleman who attempted to practice general medicine. The results are usually pitiful. Medical science is true all right, but it is harsh and impersonal. The general practitioner mixes his science with the other ingredients of his art in the proper proportion—until it reaches the consistency of a nice soothing salve, if you like.

Should the young highly qualified doctor who is being turned out today, ever find his way into country practice, he will lift medical practice in the rural districts to a plane higher than it ever was before. He will stop the building of so many unnecessary hospitals and create a background for himself. With drudgery eliminated by a nice automobile and perhaps a nurse assistant added to the many conveniences that have lately been introduced into country life, he should be able to lead a pleasant existence and enjoy a little local importance. He need not expect to make money, because practicing medicine is not a lucrative calling, and there is no money to be made at it. Still he should be able to live well and cure the people of their obsession that medical skill does not exist outside of hospitals.

The practitioner of medicine is usually depicted as carrying a medium-sized handbag. This bag contains his tools, along with some antiseptics and anaesthetics. It is conceded that he can treat successfully at least eighty-five per cent of his cases with this simple outfit. When we consider that this M. D. with the knowledge that is in him and his little bag of tools is the sole channel through which medical science can be brought to the benefit of the patient remote from hospital aid, it would look as if this facility in the use of an art so essential to the welfare of mankind would guarantee the survival of the general practitioner. And it does! Medical tools are mostly simple devices that can be easily improvised, and many of them are by no means indispensable. But the fact that medical science can be so easily applied to a practical purpose gives practical medicine an advantage that few other crafts or callings possess. The sailor must have a ship to function as a sailor; a railroad engineer must have an engine and rails before he can ply his craft. But a doctor does not need to be in a hospital before he can function as a doctor. He can practice his art in any environment and there is no place that we

can think of, where people are, that his services may not be in demand.

At the present time the medical profession is suffering from the degrading effects of overcrowding, with its consequent unemployment. Highly educated young M. D.'s are moving restlessly from place to place looking for locations. Those who have locations are barely able to make both ends meet.

This state of affairs is bad for our morale. It forces us to center ourselves on self-interest, which can so easily become ruthless.

It undermines our "pride of profession," and causes us to forget our ethics.

Some way will have to be found to limit the number of medical men in proportion to the population. Otherwise we must all bow to economic necessity and scramble for the dollar without regard to ethics or principle.

Maybe our problems can only be solved by a process of slow evolution and this generation may be old before the solution is found. But whatever happens, back of every effort to increase our authority and render our service to the public more efficient, there will be found the solid strength of the medical profession.



Eclampsias at St. Mary's Hospital of Minneapolis from 1926-1932

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IN THIS paper on eclampsia I shall review the cases at St. Mary's Hospital during the past six years, 1926-1932 inclusive, and compare these cases with those reported in the literature.

Eclampsia is an acute toxemia occurring in the pregnant, parturient or puerperal woman and is usually accompanied by tonic and clonic convulsions during which there is unconsciousness followed by more or less prolonged coma. It is not necessary to have convulsions in cases of eclampsia, but as long as eclampsia is definitely diagnosed only by the characteristic autopsy findings I will include only those cases which had convulsions.

INCIDENCE

The incidence of eclampsia has been variously reported from 0.34 per cent to 3.44 per cent of total labors in hospitals. In private practice it is found about once in 500 to 1,000 labors. For the past six years at St. Mary's Hospital we have had 3,673 labors with a total of 17 cases of eclampsia, .46 per cent which makes a very favorable comparison. It is interesting to note that during this period there has been a total of 49 toxemias of pregnancy with 17 of these being eclampsia, the percentage of eclampsia in regard to toxemias being 34 per cent. This percentage certainly is much too high. Some authorities have stated that eclampsia can always be prevented and that its occurrence indicates neglect on the part of the obstetrician. However, the conservative obstetricians, such as Litzenberg and Williams, while believing that this is true in most cases, are convinced there are some exceptions. It has been shown that eclampsia occasionally develops in spite of treatment. Occasionally it develops very suddenly, within a day. Nevertheless, be that as it may, a percentage of 34 per cent is most assuredly too high and while perhaps in the majority of these the patients did not seek medical attention in time, the obstetrician also in many cases is guilty of inadequate and improper treatment.

Reports of the literature show that eclampsia occurs more frequently in primiparae than multiparae. At this hospital we have found that the

percentage of eclampsia in 65 per cent in primiparae and 35 per cent in multiparae.

The incidence of eclampsia during the various months at St. Mary's does not agree with that found at the New York Lying In Hospital. At that institution the highest incidence was in April with a gradual reduction until November and then an increase again until April. At this hospital we had five cases in July, three in November, two each in February and August; one each in January, March, April, May, and October; and none in June, September and December. This should help to disprove any idea the New York Lying In Hospital may have had in stating that the cold damp weather had anything to do with the etiology of eclampsia. The etiology of eclampsia is still unknown: numerous theories have been advanced and one is as good as another.

SYMPTOMS AND PHYSICAL FINDINGS

In six of the seventeen cases there were absolutely no symptoms until the convulsion. In the remainder the patients had symptoms varying from one to several days or weeks. In nine of these cases, 53 per cent, the convulsions appeared before labor had begun. In five cases, 29 per cent, it occurred after labor had begun. In three cases or 18 per cent it occurred post-partum. Very severe headache was usually present. Nausea, vomiting, diarrhoea, amaurosis, and epigastric pain were the other prominent symptoms. Albuminuria and hypertension were the most constant physical findings. Albumin was always present in the urine, varying from three plus to four plus although in one case only a faint trace was reported. The blood pressure was always elevated, varying from 150 to 215 systolic. Edema was usually present.

MORTALITY

The mortality of eclampsia is very high, varying from 20 to 25 per cent for the mother to as high as 50 per cent for the child. Here the maternal mortality was only 17 per cent while the fetal mortality was 70 per cent.

TREATMENT

Stroganoff of Russia deserves the credit of having brought to the profession the first defini-

ite plan for a conservative treatment of eclampsia. He reported 800 cases with a maternal mortality of eight per cent. However, in this country such good results could not be obtained with his method. Stroganoff insists that the treatment must be carried out strictly according to his directions. This is very likely the cause of the poor results in this country. None of the cases at St. Mary's were treated strictly by the Stroganoff method. The treatment depends upon a continuous narcosis with morphine and chloral, combined with venesection, all carried out in a darkened room which is strictly quiet. At St. Mary's none of the patients have been kept in a state of narcosis, morphine and chloral having been used but sparingly. They have been used a great deal combined with other treatments. Systematic treatment is absent in most cases.

McPherson's treatment is similar in some respects to Stroganoff's method. The patient is put in a quiet dark room. She is given one-half grain of morphine, the stomach is washed out and at the end of the lavage two ounces of castor oil is poured down the tube. A colonic irrigation of five gallons of five per cent glucose is given. If the systolic pressure is above 175 a venesection is done to bring the pressure down to 150. The patient is kept quiet and is given morphine in $\frac{1}{2}$ grain doses every hour until the respirations drop to eight per minute. Patient is delivered normally. No cases at St. Mary's Hospital were treated by this method.

Magnesium sulphate intravenously is one of the newer substances used in the treatment of eclampsia. It should be used in doses of 10 c. c. of 25% solution or 25 c. c. of 10% solution. Magnesium sulphate has always been found to be a very dangerous drug to use intravenously. Respiratory and cardiac paralysis occur quite readily. Therefore it is essential that whenever this drug is given, the antidote, calcium chloride, should always be ready in a syringe and at hand to be given at once if necessary. Strander investigated the drug and concluded that six grams of the drug could be administered safely in 24 hours provided that not more than 20 c. c. of a 10 per cent solution was administered at a single dose. The correct dosage has been followed in a majority of cases at St. Mary's Hospital. In one of these 35 c. c. of 10 per cent magnesium sulphate was given. Patient was delivered of a dead fetus after manual dilation. This was followed by 50 c. c. of 10 per cent magnesium sulphate. Patient had an uneventful convalescence. In the second 50 c. c. of 10 per cent solution was given and a dead fetus delivered but the

fetus was reported to have been dead for 48 hours preceding delivery. There were two other cases not reported in the group who were pre-eclampsics whose cases have a very important bearing on this question. These patients were given large doses of magnesium sulphate. The first patient was given a 10 per cent solution of 500 c. c. of intravenous glucose. After 400 c. c. of this solution had run into her vein, 100 c. c. of a 25 per cent solution of magnesium sulphate was added to the remaining 100 c. c. of glucose and allowed to run into her vein. After the patient had received approximately 15.5 grams of the magnesium sulphate, she died suddenly. A live baby was obtained by caesarian section immediately after death. In the second case 200 c. c. of a 10 per cent solution of magnesium sulphate was given for four doses. For the first three doses, everything went along nicely. During the fourth dose the patient developed respiratory and cardiac embarrassment. Immediate administration of calcium chloride intravenously caused the woman to respond immediately. The fetal heart before this was normal; it could not be heard after this and afterwards the woman delivered a dead fetus.

Another of the newer methods of treatment is the dehydration treatment. In this the patient is given a very low fluid intake plus a mild catharsis. Patient is given quite a general diet but one that is relatively salt free and low in foods of high fluid content. The treatment is based on the assumption that there is an edema of the brain present. Occasionally if the symptoms are not alleviated, spinal puncture is done.

The above mentioned treatments come under the heading of conservative treatment. It has been demonstrated time and again that the results are better than by the radical treatment. The radicals believe that the important thing is to empty the uterus as soon as possible. The conservatives believe that this is even harmful. The radicals use accouchement force and caesarian section. No caesarian sections were done on eclampsics at St. Mary's Hospital. Two patients were delivered after manual dilation, both patients survived but both babies died, although one had apparently been dead for 48 hours.

CONCLUSION

In conclusion we may state that first of all it is important that, the patient have prenatal care and her blood pressure and urine checked carefully. After diagnosis, treatment should be instituted at once. The conservative treatment should be employed in preference to the radical treatment. The type of conservative treatment

apparently is not so important as long as it is undertaken systematically and correctly. The dosage of certain types of drugs should be watched carefully. In regard to caesarian section; it should be employed only when it is indicated by conditions other than the eclampsia.

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GLAUCOMA—RESPONSIBILITIES OF EARLY RECOGNITION

(Continued from Page 536.)

pressure above normal, should be given pilocarpine, one per cent, to use at bedtime, as pressure tends to be higher at night when the pupil dilates to maximum. These patients should wear their distance glasses, if indicated, to avoid the constant strain on the ciliary muscle, and the full correction or even slight over correction, should be ordered for reading.

If tonometric readings were taken several times a day and night and on different days, we would find variations, as in the temperature in a fever patient. These patients must be carefully watched over a long period of time. Many will procure relief from all symptoms by the use of pilocarpine. Jackson has suggested the one-half per cent homatropine provocative test, and after a wait in a dark room, should the tension reading show an increase, an incipient glaucoma is present and pilocarpine is to be ordered.

If pilocarpine holds the vision, field and tension, it may be used for months and years. It is safe to trust only the intelligent patient who can and will remain under constant observation. De Wecker has stated, "Pilocarpine has never cured

a case of glaucoma, but has prevented many cases of glaucomatous eyes from being cured." Operation will cure many of these cases, if done early, before the eye is permanently damaged. If atrophy of the iris and nerve are present, it is then too late. We would save many eyes by early operation.

I now have records of thirty cases operated on by sclerecto-iridodialysis, a combination of the Lagrange sclerectomy and de Wecker's iridodialysis. This procedure more easily and certainly frees the iris angle than does an iridectomy. The operation is made beneath a wide flap of conjunctiva, and is, I believe, free from risk of damage to the eye. All cases operated have been relieved of all symptoms. The fields have been increased in size, and the tension has remained normal. No eyes were lost. These patients have been observed from one month to forty months. Eighteen have been followed for more than six months.

The accompanying fields and tension records will show that, during the early stages of glaucoma, a contracted field may be present without tension. (Fig. 1 and 2.) High tension may be present with normal fields and normal vision. (Fig. 3.) Patients may be made comfortable for years and possible cure follow the use of miotics. (Fig. 4.) Neglected cases ultimately end in blindness. Many early cases are overlooked.

CONCLUSIONS

Glaucoma is not the text book disease, but an insidious process which like dry rot in timber may exist long before evidence is apparent. The patient, the optician, the family doctor, and the ophthalmologist, are all guilty in overlooking this condition.

Many incipient cases have relief and maintain vision for years by the use of miotics.

If operation is to be done, it must be done before the eye is seriously damaged by the pressure.

Sclerecto-iridodialysis has given the writer uniformly better results than iridectomy, terphining, Lagrange, or iridotaxis operations.



Rectal Anaesthesia in Obstetrics*

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THERE is nothing particularly new about the rectal use of anaesthetics as a means of pain relief during labour. However, it might be of interest to this Society to report the conclusions arrived at after nine years of experience with this mode of obstetrical anaesthesia.

To my mind, the history of rectal anaesthesia is rather interesting. Pirigoff in 1847 produced an anaesthesia, by forcing warm ether vapor into the rectum. Practically all his patients suffered post-operatively from a very intense ether colitis, severe enough in two cases to cause death. Then some fifty-eight years later, Cunningham evolved an ether-air combination that proved fairly successful when given per rectum, and gained some prominence, particularly in surgery of the upper respiratory tract. The same investigator, collaborating with Sutton in 1913, developed an oil-ether mixture, which required a less elaborate technique in administration, and produced a much more rapid anaesthesia than the old ether-air mixture. At the present time, this ether-oil mixture is the one almost universally used, and the literature at one time or another has contained fairly large series of cases giving satisfactory results. Thaler and Huber, in 1923, were the first to use this form of anaesthesia in the field of obstetrics, and they reported a series of deliveries where rectal anaesthesia had been used. They employed the technique used in surgical cases, and naturally, found that in the majority of their patients, one rectal injection of oil-ether was not sufficient, and the procedure had to be repeated in some cases as many as five times. In the same year, Gwathmey, of New York, whose name is most closely associated with this subject, devised his "synergistic analgesia," namely, an analgesia resulting not from the use of any one drug, but from the combined result of several drugs working in unison. This method, first given clinical trial at the New York Lying-In Hospital is, as far as I know, still routine in that institution.

My first experience with rectal anaesthesia occurred during an internship at the New York Lying-In Hospital in 1924, and I have been en-

*Read by title at the annual meeting of the North Dakota State Medical Association, Valley City, June 1-2, 1933.

thusiastic about it ever since. I don't begin to pretend it is the only or the best form of pain relief in child birth, but I certainly am of the opinion it is one of the best, and the most suitable for the man who is practicing in a community with perhaps limited hospital facilities, without a trained obstetrical anaesthetist or the equipment to give gas-oxygen anaesthesia.

The Gwathmey method is roughly divided into two parts, hypodermic injections of morphine and magnesium sulphate and the rectal injection itself. The initial hypodermic calls for morphine Gr. 1/6, dissolved in the contents of an ampoule, containing 2 cubic centimetres of a 50 per cent solution of magnesium sulphate. The hypodermic is given when the patient is deemed to be in active labour. It is given deep in the gluteal muscles, as magnesium sulphate, if given subcutaneously, has a tendency to cause a necrosis, and sloughing of the tissues around the site of injection, although I have never seen or heard of this occurring. No more morphine is given, but the magnesium sulphate is usually repeated in an hour or two, and a third hypodermic given when the rectal injection is made. The magnesium sulphate, besides tending to cause a general systemic relaxation, is supposed to greatly increase and prolong the sedative effect of the morphine. Personally, I never could prove this to my own satisfaction, and have not used any magnesium sulphate for years. In its place, at various times I have tried morphine and scopolamine, pantopon, hyoscine, barbituric acid derivatives by mouth and intramuscularly, but have for the past year or so, used only morphine and scopolamine by hypodermic, sometimes combining them with Nembutal or Sodium Amytal by mouth. At present the initial hypodermic is usually Morphine Gr. 1/6, and scopolamine Gr. 1/100, followed by hypodermics of scopolamine, Gr. 1/100; Grs.—1/200, as the case demands. The formula of the instillation to be given by rectum consists of a four ounce mixture containing Quinine Hydrobromide Grs. xx, dissolved in two drachms of alcohol, two and one-half ounces of ether, and the balance of the four ounces, olive oil. Several pharmaceutical houses market the instillation, ready

for instant use. However, I've been in the habit of simply mixing the instillation just prior to its administration.

Every case is a law unto itself as regards the period of time that should elapse following the hypodermic medication, before the instillation is given. Should the patient show a response to the preliminary hypodermic, as evidenced by a fairly marked decrease in the amount of pain, the instillation may be withheld for 1 to 3 hours. The instillation should always be given when the patient is still showing some effects of the morphine scopolamine medication. Then we will truly get a synergistic analgesia. For the same reason I have found it unsatisfactory to give the rectal instillation without any preliminary hypodermic, for the effect will be quite transient, and the end result, as far as pain relief is concerned, rather unsatisfactory. The necessary apparatus is quite simple, consisting of a small rectal tube or large catheter, a glass connecting rod, two inches of rubber tubing and a medium sized funnel.

In regard to the actual giving of the mixture, there are several points that to my mind are extremely important in making the anaesthetic a success. Make sure the patient's large bowel is as empty as enemas can make it. More than one enema is always necessary, and they should be given until the return flow is clear. The customary one enema with so-called "good results" always spells failure, because altogether likely the patient will later on, be unable to retain the anaesthetic mixture. Probably the most important points in connection with the administration of the rectal anaesthesia, is to gain the full understanding and co-operation of your patient. She should be informed fully as to what is to follow, that the rectal injection is not an enema, but it is a mixture to be retained. Tell her that if she does retain it she will go to sleep, feel no more pain, and will awake long after her baby has been born. If you can paint a glowing enough picture, most patients will have no great difficulty in retaining the instillation. About 1 to 1½ ounces of liquid paraffin or olive oil are given by rectum immediately before and after the injection of the mixture proper. This greatly removes the chances of the ether imparting a burning sensation to the rectal mucosa. If the patient is bothered with hemorrhoids, sterile vaseline is applied to them and to the anal ring. It is also wise to warn the patient that they may have this burning sensation for a minute or two, because if you don't, when the burning is at its height, the patient is very prone

to bear down and expel the anaesthesia. The funnel and tubing are filled with liquid paraffin or oil, taking pains to be sure all the air bubbles are excluded from the tubing. The rectal tube is then introduced between pains, about 8-10 inches into the rectum. If the foetal presenting part be low down, it is imperative that the tubing go beyond that level, for then the presenting part will act as a ball valve, the harder the pains, the more completely the presenting part will press on and collapse the rectum, thus aiding materially the retention of the mixture. The fluid is run in by gravity alone, taking two or three minutes. If the pains are severe during this period of time, the tube may be temporarily clamped by the fingers during the height of the contraction. As soon as all the fluid has entered the rectum, the tubing is slowly withdrawn between pains and then an attendant should sit by the patient, and with a folded towel press the buttocks together. Pressure should also be exerted upwards during the next few pains. Some patients will for a minute or two following the instillation, have a desire to empty the lower bowel, but the great majority show no apparent difficulty in retaining the instillation. The patient should be left as undisturbed as possible, all unnecessary noises about her eliminated, and any conversation carried on in low tones. The lights should be dimmed and possibly an eye shade of gauze placed over the patient's eyes.

The effects are noticeable in a very short time, because the absorptive area of the large bowel is so great that the ether is absorbed and becomes systemic in about one-half the time it takes when given by inhalation. So, very often, the ether is tasted by the patient before the injection is completed. The odor will be on the breath in four or five minutes and by fifteen minutes, often less, the patient is either very stuporous, or fast asleep. Labour is not prolonged. The uterine contractions go on just as regularly, just as frequently and forcibly as before, and the strength and frequency will increase proportionately as the second stage progresses. The effects of this synergism will probably last from two to six hours, depending on the stage of labour, and the patient's susceptibility to ether. Should there be some disproportion between the size of the foetal head and the maternal pelvis, some malpresentation or a dystocia due to any cause, resulting in a prolonged labour, it may be necessary to give a small dose of scopolamine, when the effect of the instillation has worn off. In the majority of cases

a small amount of ether or chloroform, by inhalation, is needed as the head sweeps over the perineum, or when repair work is necessary. I have, however, in one or two cases, done an episiotomy, followed by prophylactic forcep extraction and prinal repair, without any additional anaesthesia whatsoever.

Naturally, the question arises, what possible dangers are there to mother or babe in this form of anaesthesia? In my experience, there is absolutely no danger to either mother or child, and I haven't read of anyone using this anaesthesia reporting any deleterious effects. There are practically no contra-indications to its use. It has been given safely in pre-eclampsics, and in cases with cardiac complications of a type that are not truly decompensated. Possibly it should be withheld in cases that are possible Caesarians and are being given the so-called "test of labour," or in cases of premature labour, where it is desirable to safeguard the premature to the greatest possible extent.

There are only one or two disadvantages that might be mentioned in regard to rectal anaesthesia. In a few cases, the patient becomes irrational and sometimes highly excitable under the effects of analgesia. This may show itself only in incoherent speech and delusions or hallucinations, or the patient may become extremely violent and quite difficult to handle. This result is not at all desirable in a private home, occurring as it does, after the obstetrician has told the anxious relatives what peace and calm the instillation will bring to the patient. However, wild as the patient may be, labour is not prolonged. Of course, this type of reaction may possibly be due to the scopolamine, but it has occurred in cases where no scopolamine has been given. Then, in multipara, one should never leave the patient, once she is under the effects of the anaesthetic, for labour may advance, and even terminate while the patient is fast asleep. For this reason, a nurse, or one experienced in obstetrics, should always be present when the case is being conducted in a private residence. In about five cases in this series, the patient during the first twenty-four hours after delivery had a slight tenesmus

accompanied by several small defaecations. This is bothersome and should be avoided if possible. For this reason where the patient complained of more than the usual amount of burning, when the anaesthetic was given, the delivery room nurse was instructed to insert a rectal tube, after delivery, and syphon off the contents of the large bowel, and then two or three ounces of warm mineral oil were run in and left in the rectum. This precaution will, in all cases, prevent the development of this bothersome complication. Furthermore, patients who have had rectal anaesthesia seldom need any laxative for the first few days post partem. It is interesting to know that a 50 per cent solution of ether in the rectum will in ten minutes kill all bacteria in the larger bowel, which minimizes the chances of a perineal infection where extensive repair work has been done. Vomiting after rectal anaesthesia occurred but seldom. Usually the woman had eaten very heavily, just prior to admission, evidently looking forward to a week or ten days of semi-starvation while in the hospital.

Figures in a paper like this are apt to be boring, so I will simply state that I have used rectal anaesthesia in between 650 and 700 deliveries and have classified the result as satisfactory in about 78 per cent of this series. I base the result as satisfactory or otherwise entirely on the pain recollection of the patient herself, twenty-four hours after delivery. Each patient classifies her own case for me. I think this is the only way to really satisfactorily tabulate the results of any form of obstetrical anaesthesia.

Let me say then, in closing, that with the so-called "rectal synergistic analgesia" we are able to give to the parturient woman, in the throes of physical pain and mental anguish, a relief that is entirely safe and in the great majority of cases quite adequate. This is to my mind a godsend to the patient and certainly to her obstetrician, and is all the recommendation that rectal anaesthesia needs. And may I hope that the suggestions and pointers contained in this paper, will be of practical service to any of you who might become interested in this form of pain relief.



Polycythemia Case Report*

M. D. Westley, M.D.
Cooperstown, N. D.

MRS. O. S., aged 45, consulted me in September, 1931, complaining of pain with redness and swelling of the big toe, headache, weakness and flushing of the face.

Examination elicited some enlargement of the liver and spleen. Her blood pressure was 145/95. Her symptoms continued and the patient was advised to go to a clinic.

On November 24, 1931, it was found that her red blood count was 10,000,000, leukocytes 25,000, hemoglobin 105 per cent, and a diagnosis of polycythemia was made.

X-ray treatments were given over the spleen and long bones, with some improvement. The blood examinations have given the following results: June 29, 1932: R. B. C. 8,800,000; leukocytes 23,4000; Hb. 95 per cent. March 25, 1933: R. B. C. 7,500,000; leukocytes 16,200; Hb. 95 per cent. May 27, 1933: R. B. C. 8,240,000; leukocytes 18,300; Hb. 100 per cent.

The patient has not had any medication. Phenylhydrazine H. has not been tried. She complains now of headache. Her diet has been restricted and she takes small doses of salts every day.

I would be glad of some suggestions as to prognosis and diet.

DR. WILLIAM H. LONG, Fargo: Polycythemia occurs in two forms. Polycythemia vera is a very rare condition. Besides that we have polycythemia of the symptomatic type that occurs in heart disease, mitral stenosis sometimes and also in chronic emphysema. This lady had no evidence of emphysema and no chronic heart condition, but had marked enlargement of the spleen. This is very rare in the symptomatic type of polycythemia but occurs in the idiopathic type or polycythemia vera. This occurs usually in individuals from 35 to 40 years of age and runs a chronic course. I think no case of spontaneous remission is known to have occurred.

These patients commonly seek help because of headache, drowsiness and nervousness. The physical appearance is much more striking as a rule than in this case. The lips ordinarily look quite blue. This woman has a red count now of

8,240,000 but her lips do not appear particularly blue. More striking than the lips is the appearance of the hands, the palms sometimes are almost crimson and often we can get a clue to this disorder from the appearance of the hands alone.

Sometimes these patients are suggestive of goiter. They are prone to vascular disturbances because of the increased viscosity of the blood, which is strongly increased. Any slight disturbance of circulation will cause thromboses. In the older individuals the vascular complications are quite likely to prove fatal. We have seen several who came in with thromboses of the peripheral vessels. The spleen in many instances is enlarged tremendously and fills almost the entire abdomen. This patient says she has no discomfort from pain in the side or abdomen, but the spleen is markedly enlarged. The blood counts in these cases may vary from 6,500,000 to 10,000,000 erythrocytes and leukocytes in proportion. The patients usually go on for years in comparative comfort, but always restricted.

The treatment in the past was repeated bleedings but recently radiotherapy has been used. In the last few years phenylhydrazine in 1.5 grain doses three times a day, with the patient under careful observation during its administration has been advised. It brings the hemoglobin down very rapidly but one must be careful not to bring it down further than desirable. When the desired point is reached they can be placed on a maintenance dose of phenylhydrazine. I have a patient who has taken 1.5 grains every other day for a year and only twice has had to increase the dose temporarily. In starting the treatment with phenylhydrazine the hemolysis is quite rapid. The patients become very jaundiced, the urine becomes dark, and if the treatment is carried out too rapidly some suppression may occur and thrombosis. The treatment should be started with great care.

Recently I have seen a report of the use of Fowler's solution in these cases. The author made no attempt to explain its use, but he presented several cases and his experience seemed sufficient to make me feel like trying it, although we formerly used this to increase the blood rather than break it down.

*Read before the North Dakota State Medical Association at Valley City, June 1-2, 1933.

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NEGLECT NOT THE LESSER TALENTS

Lord Chesterfield, in a letter to his son back in 1741 wrote "Great talents such as honor, virtue, learning and parts, are above the generalities of the world, who neither possess them themselves nor judge of them rightly in others; but all people are judges of the lesser talents, such as civility, affability and an obliging, agreeable address and manner, because they feel the good effects of them as making society easy and pleasing." On another occasion but in the same vein of thought he called attention to the significant fact that "The manner of your speaking is full as important as the matter, as more people have ears to be tickled than understanding to judge."

How often we see this illustrated in the practice of medicine: the barely-passed graduate goes out and acquires a large following, while the honor student fails to impress those whom he comes in contact with, and is therefore reputed to be a failure. Success in the practice of medicine is not dependant on scholastic attainments and scientific knowledge alone. It depends very often upon something quite apart from this. Shall we call it art or shall we call it aptitude? The fact remains that there is a certain suitability of mind and manner that instills confidence, of inestimable value to the sick, easily sensed by the patient but not determinable by class room examinations.

Physicians should not become so engrossed in

scientific lore that they neglect the "lesser talents" of which all people can judge. It is not necessary; these greater and lesser talents are perfectly compatible and should go hand in hand.

A. E. H.

A CHALLENGE TO NORTH DAKOTA PHYSICIANS

An associate recently stated that the laity is so well versed in cancer it will take the medical profession years to catch up. If this indictment is true, it is time that something be done about it. The American Society of the Control of Cancer has spent large sums of money during the past decade educating the public to recognize the early signs of cancer and urging people to consult a physician at once if these signs should appear. However, studies made everywhere on the subject of delay, reveal the sad fact that the delay is not always due to procrastination on the part of the patient, but too often to inability of the physician to recognize early cancer. Sometimes a malignancy is suspected, but the physician fails to impress the patient with the seriousness of the situation. Certainly, if we are to live up to the trust placed in us as practitioners of the oldest art, we cannot plead innocence on either score. It is equally as great an indictment, if we fail to convince a patient that he or she must have immediate care when early cancer is present, as it is to neglect making an early diagnosis of

cancer. Both responsibilities are squarely on the physician.

At the last meeting of the North Dakota State Medical Association it was decided to ask the American Society for the Control of Cancer to make a survey of the state. A state committee, consisting of Drs. E. P. Quain (chairman) and L. W. Larson, Bismarck, Dr. Russell Gates, Minot, Dr. H. E. French, Grand Forks and Dr. Frank I. Darrow, Fargo, has been appointed to serve on the cancer committee of the state association. Dr. Flude, field director of the American Society for the Control of Cancer has recently made a tour of the state to determine the facilities available for accurate diagnosis and adequate treatment. The state committee has agreed with the policy of the American Society that the profession must be educated in cancer. It has been decided to urge all district societies to hold at least one symposium on cancer during the coming winter, and that the subject of breast cancer be stressed this year.

It is hoped that all North Dakota physicians will assist in this campaign to reduce the mortality due to cancer. Incomplete reports from the Census Bureau indicate that the cancer mortality rate in North Dakota rose about eleven per cent in 1932 as compared with 1931. We can be justly proud of our low mortality rates from infectious diseases, including tuberculosis, but cancer is increasing all too rapidly. Early diagnosis and immediate removal or destruction of the local growth is our only hope for a lowered mortality rate. The public is as "cancer conscious" at present as it needs to be, but the members of our profession must acquire more of this cancer consciousness, if they are to do their part in the fight on this dreaded disease.

L. W. LARSON, M. D.

FEDERAL EMERGENCY RELIEF AND ALREADY ESTABLISHED AGENCIES

Federal emergency relief administrator, Harry L. Hopkins, speaking before the Minnesota state meeting of social workers in Minneapolis, is reported to have said anent governmental responsibility in relief, that "the government will not spend a cent for the aid of hospitals or care of the sick, and don't ask me the reason why."

The sentence as quoted arouses curiosity by reason of its length and fails to satisfy that curiosity by reason of its brevity. The statement is perfectly reasonable but for the challenge that goes with it.

The administration has issued rules and regu-

lations governing medical care provided in the home to recipients of unemployment relief. In this we read "It shall imply continuance in the use of hospitals, clinics and medical, dental and nursing services already established in the community and paid for, in whole or in part, from local and/or state funds in accordance with local statutes or charter provisions. Federal emergency relief funds shall not be used in lieu of local and/or state funds to pay for these established services."

Clearly then the inference appears to be that each community is expected to continue its local charity work. The community fund is needed more than ever. The annual "drive" for this is nearly here. Physicians who can, will continue to give their sympathetic support to the movement.

A. E. H.

MINNESOTA'S OLDEST DRUG STORE

Anyone interested in the early medical history of this area would experience genuine pleasure from a visit to the "Old Drug Store" at Shakopee. It was founded by H. W. How in 1857, before Minnesota had become a state. It was later sold to H. H. Strunk and has been operated by H. H. Strunk & Sons these many years. The only surviving member of that firm is A. M. Strunk, now in possession, one of the sons. He was born in 1857, the very year that the drug store was established, and started to work in it when he was 15 year old.

The building, old in style but well preserved, attracts the visitors attention. The sign of the pestle and mortar, which appears to have been painted above the front door, is faded and indistinct. The windows, one on each side of the street door, of a size and dignity that bespeaks the past, contains only a small fraction of the stock. Neither here nor within does one find any display of bathing caps nor golf balls and on entering one looks in vain for any resemblance to a lunch counter. In alphabetically arranged bottles on the shelves above and in drawers below, are to be found well known drugs that have stood the test of time. In the show cases may be seen nursing bottles and sick room accessories; and on the floor in front of these are baskets containing garden seeds in bulk so that they may be inspected and purchased by weight. Cinnamon, nutmeg and other spices may be had in their original form or ground to order. It is indeed a drug store and one that every medical man would delight to inspect.

A. E. H.

IN MEMORIAM—FRANCIS ASBURY
BRYANT

Francis Asbury Bryant, M.D., Herrick, S. D., born Feb. 8, 1851. Died Aug. 21, 1933, aged 82 years.

He received his premedical education at Southern Iowa Normal School, Troy, Iowa. Graduate in Medicine of Keokuk Medical College of Physicians and Surgeons at Keokuk, Iowa, class of 1876.

Located at Herrick, S. D., 1913. Was active in his local District Medical Society. Served as secretary-treasurer for 1913 to 1922. As president 1922-1923. A consistent member of the South Dakota State Medical Association and the American Medical Association since 1913. Member of the State Pharmacy Association. Doctor Bryant held many important offices in his community.

Literary efforts, he wrote: "A Romance of Two Lives" (published), "The Slave of Dream Water," "Echoes of a Log School House" and "Leaflets of the Mystic Trail" (poems).

Fraternal affiliation. Mason over 50 years, member of Yankton Consistory 32nd degree, M. W. A. and R. N. A.

Deceased survived by his daughter Mrs. S. E. Willhelmy of Caldwell, Idaho, his sons Lowell Clark of Missouri, Paul L. of Portland, Oregon, and two brothers, A. J. of Denver and W. C. of Griswold, Iowa.

J. F. D. C.

NEWS ITEMS

The season is now at hand for holding the District Society meetings, and we extend a most cordial invitation to all secretaries to send us promptly reports of their meetings, with any news items that are of interest to the profession.

Dr. K. Olafson, formerly in practice at Winnepeg, is now located at Cando, N. D.

Dr. R. H. Picha, Hopkins, Minn., was married last month to Miss Helen M. Bren, of that city.

Dr. J. J. Rouse, formerly of Nopeming, Minn., is now located at Neshkoro, Wis., where he will continue general practice.

Dr. J. Emery Frank, formerly of Cottonwood, has moved to Springfield, Minn., where he will continue general practice.

St. Lukes Hospital, Fergus Falls, Minn., has been left \$20,000 from the estate of the late Dr. T. N. Kittleson, of that city.

Miss Mary Louise, daughter of Dr. and Mrs. J. E. Crew, Rochester, was recently married to Dr. C. H. Slocumb, of that city.

Dr. and Mrs. J. J. Kolars, Le Center, Minn., will return home this month, after spending several months in touring Europe.

Dr. H. H. Stoner, who was in active practice for many years at Highmore, S. D., died recently at his home on Los Angeles, Calif.

Mitchell will entertain the members of the South Dakota Medical Association and the annual meeting will be held on May 14, 15 and 16, 1934.

A dinner opened the fall meeting of the Cass County Medical Society at Fargo, with Drs. G. C. Foster and G. A. Larson being the principal speakers.

Dr. R. B. Richardson, Great Falls, Mont., has been appointed Division Surgeon of the Great Northern Railway, to succeed the late Dr. A. F. Longeway.

Dr. A. D. McCannel, Minot, was the guest speaker at the September meeting of the members of the Southwestern Medical Society held at Dickinson, N. D.

Dr. Max H. Hoffman, St. Paul, has recently returned from a seven months absence spent in Europe, most of this time being spent in Vienna, in medical studies.

The Northwestern Medical Society held their opening fall meeting at Minot, N. D., with a large attendance of members and many important items of business were discussed.

The Grand Forks District Medical Society held their fall meeting at Grafton, N. D., with Dr. John McEarchern, of Winnipeg, being the guest speaker, his subject was "Cardiology."

The Mower County Medical Society held their first meeting of the season at Austin, Minn., on September 28th. The society plans on holding monthly meetings with special interesting programs being presented.

The Nicollet-Le Sueur County Medical Society, held at St. Peter, brought out a large attendance, with two special prepared papers being presented, Dr. S. Ericson, "The County Society;" Dr. L. A. VanHale, "Case Reports."

Dr. Walter D. Leach, who recently retired

from active practice at Callaway, Minn., after a service of over 25 years, died very suddenly from a heart attack. Dr. Leach was well known and very popular in that section of the state.

Dr. and Mrs. W. D. Beadle, Cannon Falls, Minn., were hosts to over sixty of the medical profession at their home last month. After a fine dinner was served, an interesting program was presented, a general discussion following each number.

A verdict of \$24,640 was awarded against the St. Lukes Hospital, Duluth. The suit was the outgrowth of a patient being badly injured by jumping from a window. This is the largest verdict ever rendered by a jury in Minnesota, and a new trial will follow.

Dr. V. L. Evans, a graduate of Loyola Medical School and who took his internship at Mercy Hospital of Chicago, recently finished a three-year fellowship of internal medicine at the Mayo Clinic, is now associated with the Bratrud Clinic of Thief River Falls, Minnesota.

The North Dakota State Nurses Association held their annual meeting at Rugby, this month, with a large attendance and an interesting program being presented each day. Drs. A. D. McCannel, A. E. Pierce, Mrs. Gilbert and Miss Brown were the principal speakers.

The Minnesota Academy of Medicine held their October meeting at the Town and Country Club. Officers for the coming year are Dr. C. R. Freeman, president; Dr. A. E. Wilcox, vice president; Dr. R. T. LaVake, secretary. Drs. Emil S. Geist, James Gilfillan and J. C. Litzenberg, executive committee.

The Minnesota State Medical Association, in a bulletin recently issued, said that more than 7,300 persons in Minnesota are afflicted with cancer, and at least 9,500 were diabetes, and that the chronic diseases, which are increasing, are not due to advancing age, as they are increasing faster than the population ages.

At the annual meeting of the Southern Minnesota Medical Society, held at New Ulm last month, the following officers were elected. Dr. M. C. Piper, Rochester, president; Dr. S. A. Slater, Worthington, first vice president; Dr. W. G. Workman, Tracy, second vice-president, and Dr. H. C. Habein, Rochester, secretary.

Dr. H. E. Kleinschmidt, field representative for the National Tuberculosis society, was the

principal speaker at the first fall meeting of the Yellowstone Valley Medical Society. September 27, at Billings, Mont. Dr. Kleinschmidt addressed the local medical fraternity two years ago and his return engagement was arranged at the request of members.

The problem of the army surgeon in the treatment of wounds will be greater in "the next war" because of the increased velocity of rifle bullets, Dr. Louis B. Wilson, of the University of Minnesota told the Association of Military Surgeons at its convention recently held in Chicago. He said the new rifle of the army has a muzzle velocity nearly twice that of the older models.

A luncheon meeting of the Steele County Medical society to discuss problems of the National Recovery Act as it is applied to physicians and surgeons was held at Owatonna, Minn. Dr. G. G. Morehouse, NRA "general," spoke on "The National Recovery Administration Act and Its Relation to Physicians." Members of the society agreed to sign the code individually and to assist in its operation.

The Yankton District Medical Society held their first meeting on October 6th, at S. Dak. The program consisted of a clinic presented by the State Hospital Staff. The discussion and presentation of cases as follows: General Discussion, Dr. G. S. Adams; General Paresis, Drs. Hass and Hill; Psychosis and Other Brain and Nervous Diseases, Post Lethargic Encephalitis, Drs. Moore and Wynegar. E. W. Jones, M.D., president of the South Dakota State Medical Association made his official visit at this meeting.

The extension division, University of Minnesota, opened a course of lectures for the Renville County Medical Society, with the following physicians participating: Oct. 17, Dr. Myron O. Henry, "Intracapsular Fractures of the Hip." Oct. 31, Dr. J. A. Myers, "Tuberculosis." Nov. 7, Dr. F. C. Rodda, "Differential Diagnosis. Meningitis and Simulating Conditions." Nov. 14, Dr. A. F. Bratrud, "Treatment of Hernia by Injection Method." Nov. 21, Dr. G. R. Dunn, "Fractures." Nov. 28, Dr. E. J. Hueneckens, "The Differential Diagnosis and Treatment of Convulsions in Childhood."

Four applicants by examination and nine by courtesy have applied to the state medical examining board for certificates to practice medicine in Montana. The applicants by examination included Leland Guy Russell, Billings; H. A. Stanchfield, Wise River; S. A. Adaskavich,

Chicago; J. R. Vasko, Iowa City, Iowa. The applicants by reciprocity were: F. P. Schemm, Great Falls; B. R. Tarbox, Miles City; R. J. Holzberger, Great Falls; P. L. Jones, Elvins, Mo.; W. G. Durnin, Great Falls; G. A. Carmichael, Butte; M. R. Snodgrass, Miles City; Paul L. Eneboe, St. Paul, Minn.; R. B. Farnsworth, Chamberlain, S. D.

The Academies of Ophthalmology and Otolaryngology of both Dakotas were guests of the Mayo Clinic at Rochester last month. A fine representation of the membership of the societies was in attendance. The morning was devoted to operative clinics and a tour of the buildings, and the afternoon was given to addresses and discussions of topics of especial interest to the groups—these by various members of the clinic and the eye, ear, nose and throat staff. A complimentary dinner at the Kahler Hotel, with an evening session, concluded a full and informative day. This meeting afforded a wonderful opportunity for fraternal fellowship to those attending.

Gerhard John Stramer, thirty-three years of age, entered a plea of guilty to a charge of practicing healing without a Basic Science Certificate, before the Judge of the District Court at Anoka,

Minn. Stramer for some time has been calling on farmers and other people with a medicinal preparation that he has been selling called Trunox. He has made a specialty of calling on those suffering from arthritis, neuritis and other such ailments. In July of this year Stramer was arrested and entered a plea of guilty to peddling without a license at New Ulm, at which time he was fined \$50.00 and costs. He was ordered to leave the State due to the fact that he is not a resident nor a citizen of this State, having come here from Pasco, Washington, about May 15, 1933. It developed, however, that Stramer did not leave the State but returned to the vicinity of Elk River. Upon Stramer's agreeing to absolutely refrain from violating the laws of this state in the future, and upon his agreeing to return to the home of his mother in Iowa, together with his family, the Court imposed a jail sentence of six months, which was suspended. Stramer was given to understand that he had to get out of this business in its entirety and that he was to find some other occupation. He was also warned that if he attempted to follow the same occupation in the State of Iowa, he undoubtedly would be prosecuted down there.

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Frederick Salmon, the Founder of St. Mark's Hospital, and His Ligature Operation for Internal Haemorrhoids*

W. B. Gabriel, M.S., F.R.C.S.†
London, England

FREDERICK SALMON was born at Bath in 1796: his medical education was at St. Bartholomew's Hospital, where he became a member of the Royal College of Surgeons in 1818. In 1827 he was elected surgeon to the General Dispensary, Aldersgate Street. His writings show that he was at this time specially interested in diseases of the rectum, and in 1835, in spite of a good deal of professional opposition, he acquired some premises at 11 Aldersgate Street, and opened an institution which was named The Infirmary for the Relief of the Poor, afflicted with Fistula and other Diseases of the Rectum. Rules for the appointment of officers were drawn up: the Lord Mayor of London, William Taylor Copeland Esq., was the first President, and Frederick Salmon was the Surgeon to the Infirmary. Seven beds were available and there is on record a report of 131 cases admitted during the first year's work: it is of interest to note that 34 cases of stricture were admitted, whereas the cases of piles numbered only 26. The subsequent hundred years have certainly witnessed an astonishing decrease in the incidence of rectal stricture which is now (in England) a comparatively rare occurrence.

In 1838 the Infirmary was moved to 38

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†Surgeon to the Royal Northern Hospital and to St. Mark's Hospital.

Charterhouse Square where 14 beds were available, and the work of the hospital, both in-patient and out-patient, gradually increased. In 1851 the present site of the Hospital in City Road was purchased from the Worshipful Company of Dyers, and the Dyers' Almshouses were adapted to form a hospital with 25 beds. The opening paragraph of the Annual Report read before the General Meeting of Governors in February 1854 is as follows: "On Tuesday April 25 (1854), being St. Mark's day, your Committee have the gratification to announce that the long looked-for opening of the New Hospital will



Crest of St. Mark's Hospital



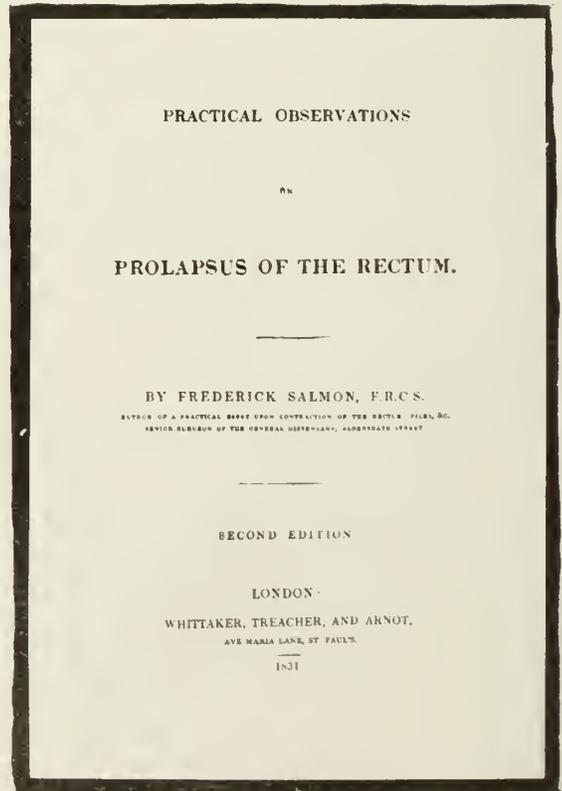
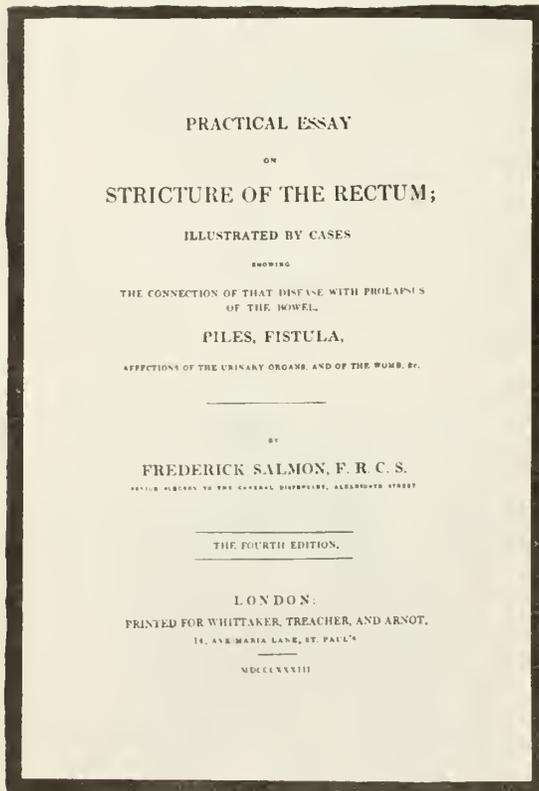
FREDERICK SALMON, M.R.C.S.
Painted by Francis Grant, R.A., 1859

take place under the auspices of the Right Honorable the Lord Mayor, its president." This appears to have been the occasion of the formal adoption of the name of St. Mark's Hospital, and ever since then the hospital crest has been the Lion of St. Mark.

Frederick Salmon continued an increasing work here as the Honorary Surgeon, and in 1856 a total of 695 patients were admitted to the hospital. In 1857 two assistant surgeons (Lane and Gowlland) were appointed, and in 1859 Salmon resigned from the active staff, after

twenty-three years' work, in the course of which it is recorded that he performed more than 3,500 operations without a single fatal result. His portrait, which is shown here, was painted in 1859 and now hangs in the Board Room of the hospital. After living in retirement in the country for nearly ten years, Frederick Salmon died on January 3, 1868 at the age of 72. His death was noted at the Annual Meeting held a month later in the following memorable terms—"Thus has passed from this world a man whose kindness of heart induced, and whose indomitable perseverance enabled him to found an institution for the relief of the sufferings of his poorer fellow-creatures, which will stand an honourable monument to his memory as one amongst the many noble charities which adorn the metropolis of the country."

We will turn now to Salmon's writings and to the operation for haemorrhoids which later became known as Salmon's operation. His "Practical Essay on Stricture of the Rectum" was published in 1828: the title page of the fourth edition of this work is shown in the accompanying figure, and a paragraph from the preface which was written in April, 1833, exactly one hundred years ago, is worthy of quotation:



Showing Title Pages of Two Early Works by Salmon. Referred to in the Text

"I have likewise given in detail several new cases . . . with the view of proving the lamentable inattention which is paid to the treatment of the diseases of the rectum even at the present time."

This complaint has been made since then on many occasions, and in many books even up to the present day.

"Practical Observations on Prolapsus of the Rectum," of which the second edition was published in 1831, is of particular interest for it indicates the gradual way in which Salmon appears to have progressed in his choice of operation for haemorrhoids. At this time there was a controversy as to the relative merits of ligature versus excision: the idea of combining the two methods had not yet been arrived at and in this monograph Salmon records the following opinion against simple ligature, that is, when carried out without any cutting of tissues:

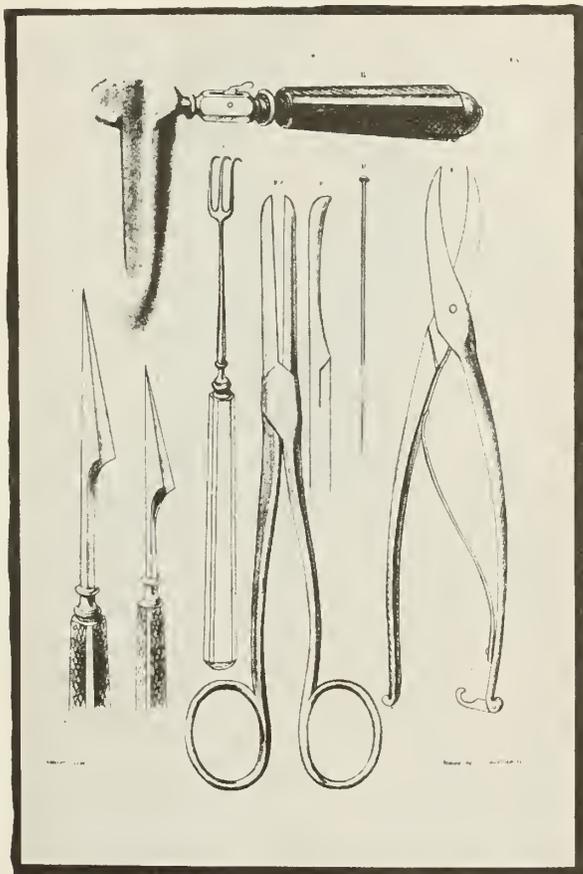
"In the removal by ligature, we shall have to encounter much local irritation, and not unfrequently severe constitutional disturbance; over which, when it is once excited, we have but limited control. Provided there are several tumours (a common occurrence), we shall be necessitated to perform several operations. The application of the ligature is usually extremely painful, its operation tedious, and not unfrequently incomplete, either from the ligature getting loose, or by reason of the base of the tumour being left, which forms a nidus for the return of the disease. The treatment after the removal of the tumours is likewise protracted; and, lastly, it is, I think, inapplicable where there is any material distension of the hemorrhoidal veins.

The application of ligatures to veins is, I think, one of the most uncertain operations in surgery. I have so often seen fatal results follow their use, that I confess I am not a little prejudiced against the operation; and I believe that the failure of the removal of the excrescence by this plan is often referrible to the injudicious manner in which the ligature is placed upon the enlarged hemorrhoidal vessels.

Now, the removal of the excrescence by excision is more expeditious, it is more complete, the pain is less, as is the danger either of local inflammation, or of constitutional disturbance; the parts heal more kindly, and, finally, when we are compelled to divide the enlarged hemorrhoidal veins, the probable danger from hemorrhage is not by any means

so great as that which is to be apprehended from the constitutional and local disturbance which almost invariably follows the including of them in a ligature."

He then goes on to describe an excision opera-



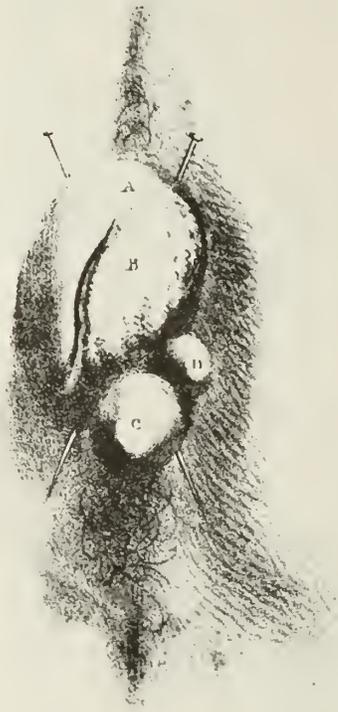
Showing Instruments Depicted by Salmon in Prolapsus of the Rectum, Plate IV

- A—The dilator.
- B—The movable handle of the dilator.
- C—The prolapsus scissors.
- D—One of the pins.
- E—The hook.
- F—The forceps—front and side view.
- G—The scoops for dividing the sphincter.

(NOTE—The scissors are Salmon's well-known spring scissors, which are still used in St. Mark's Hospital chiefly in the course of fistula operations. The sharp scoops were used by Salmon for dividing the external sphincter in certain cases of spasmodic contraction of the muscle.)

tion in which the prolapsed pile was first transfixed by one or more of the pins shown in the accompanying figure:

"The sufferer being placed in a convenient position, an assistant separating the nates, one or more of the pins, as may be necessary, is to be passed from above downwards transversely through the basis of the tumour; these penetrating the muscular coat of the bowel, will prevent the return of the intestine



An Extreme Case of Piles, with Pins Fixed Prior to Their Removal
From Salmon on Prolapsus of the Rectum, Plate II, 1831)

after the diseased part is removed. The pain produced by this part of the operation is insignificant.

The prolapsus being thus secured, the operator, with the hook or the forceps, is to lay hold of one of the prominent portions of the tumour, and to draw it gently towards the opposite side; with one stroke of the scissors he is then to remove the part as deep as the line of division between the mucous and muscular coats of the rectum, the latter of which should be left entire, otherwise a permanent difficulty of relieving the bowels will follow the operation. In like manner all the protruding portions of the prolapsus are in succession to be taken off.

If any *material* bleeding occurs, it is to be checked by the means generally used for stemming hemorrhage, such as cold or astringent washes. In most cases the flow of blood, which it is better to encourage to a certain degree, will cease spontaneously; but if we are compelled to apply any ligature, it may be done with facility, as while the pins remain in their situation, we have a commanding view of the parts.

It is my custom to leave the pins in their place for an hour or more after the operation, or the cessation of hemorrhage, to permit the blood to coagulate in the extremities of the divided vessels, by which we prevent any recurrence of bleeding after the bowel is restored to its natural situation. Having removed them, the surface of the divided part should be smeared with sweet oil, and the rectum returned within the sphincter in the gentlest possible manner.

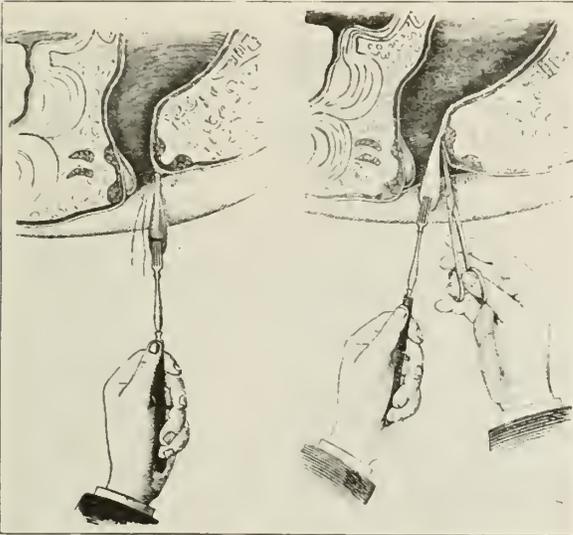
The after treatment of the case is usually simple, requiring only that the patient be kept in a state of perfect quietude, and supported upon the most sparing diet, of a liquid description; so as, if possible, to avoid the necessity for passing any evacuation for the first two or three days. At the expiration of such time, the action of the alimentary canal is to be induced by the administration of a mild purgative, assisted during its operation by an enema."

The operation of ligature *plus* excision which was evolved and practised by Salmon with notable success, was thus described by William Allingham in 1871 (*Diseases of the Rectum*, 1st edition):

"I shall now describe the mode of treating haemorrhoids and prolapsus by the ligature, as applied at St. Mark's Hospital, after the manner devised by the late Mr. Salmon, and practised at the institution for more than thirty-five years. In expressing, as I do most unreservedly, the opinion that ligature is by far the best and most generally applicable method of operating upon haemorrhoidal diseases, I must be understood to refer to the operation I am about to describe, and not to the usual method of applying the ligature by transfixion of the base of the pile, and tying it in halves.

The haemorrhoids are to be seized by the operator one after another with a vulsellum or pronged hook-fork, and drawn down; he then, with a pair of sharp strong spring sissors, separates the pile from its connection with the muscular and sub-mucous tissues upon which it rests; the cut is to be made in the sulcus or white mark which is seen where the skin meets the mucous membrane, and this incision is to be carried up the bowel, and parallel to it, to such a distance that the pile is left, connected by an isthmus of vessels and mucous membrane only.

There is no danger in making this incision, because all the large vessels come from



Two stages in Salmon's operation showing the use of the sharp hook, the incision with straight scissors at the mucocutaneous junction, and the application of the ligature. (From William Allingham on Diseases of the Rectum, fifth edition.) (NOTE—This is correct. The quotation in text is from the first edition, which was not illustrated.)

above, running parallel with the bowl, *just beneath the mucous membrane*, and thus enter the *upper part* of the pile. A well-waxed, strong, silk ligature is now to be placed at the bottom of the deep groove you have made, and the assistant then drawing out the pile with some decision, the ligature is tied high up at the neck of the tumour as tightly as possible. If this be done, *all the vessels must* be included. The silk should be so strong that you cannot break it by fair pulling. A portion of the pile may now be cut off, taking care to leave sufficient stump beyond the ligature to guard against its slipping. When all the haemorrhoids are thus tied, they should be *returned thoroughly* within the sphincter; after this is done, any superabundant skin which remains apparent may be cut off; but this should not be too freely excised for fear of contraction on the healing. An injection of Liq. Opil sedativus may be administered. I always place a pad of wool over the anus, and a tight T-bandage, as it relieves pain most materially."

This operation with minor modifications is the one which is still the operation of election in St. Mark's Hospital. The principle of making an incision with straight scissors at the muco-

cutaneous junction, and ligating the piles in turn still holds good. I believe that the results have been improved by the following modifications:

1. Postponing operation in cases of septic or inflamed internal piles.

2. Avoidance of "high stripping:" by this I mean taking the dissection of the internal haemorrhoids unnecessarily high, which makes large, raw surfaces inside the rectum. Ulceration is then liable to occur, followed by cicatricial contraction when the ulceration eventually heals.

3. Use of chromic catgut as the ligature material. Experience has shown that the rectal wounds tend to heal more smoothly with this ligature material compared with silk, as used in Salmon's day; instead of leaving the silk ligatures three inches long to form a septic, untidy bundle in the anal canal, catgut ligatures should be cut to a quarter or half-an-inch in length. This gives comfort to the patient and greater ease to the nurses in keeping the region clean.

In conclusion the following paragraph from the original address (1835) may be quoted: it was almost certainly drafted by Frederick Salmon himself and it can justly be claimed to describe the policy of St. Mark's Hospital ever since its foundation:

"The Charity claims the title to distinguished usefulness in respect of its practice being freely thrown open to the medical public: by means of which the treatment adopted is submitted to the unerring test of experience, while an opportunity is afforded of studying the Diseases of the Rectum in all their baneful varieties."



St. Mark's Hospital Today

The Embryological and Evolutionary Manifestations in Ano-Rectal and Colonic Disease*

Edward G. Martin, M.D., F.A.C.S.†
Detroit, Mich.

CLARA MARSHALL in discussing embryology in the American Journal of Obstetrics in 1855, succinctly states "*the human embryo during development builds up its own ancestral tree.*" Developmental defects are intriguing because of their etiological mystery rather than to any remarkable achievements to be obtained by surgery. The human embryo is commonly divided into the foregut, midgut, hindgut, proctodeum, and postanal gut. The midgut which disappears before birth is closely associated with the yolkstalk or vitelline duct, and in approximately two or three per cent of humans this is not obliterated entirely and remains as "Meckel's diverticulum." The proctodeum (future anus) joins the hindgut (future rectum) in the process of development, and in one stage is separated by a membrane called the "anal plate." Failure of a junction or dissolution of this membrane accounts for the abnormal conditions broadly classified as imperforate anus, atresia etc., and when the proctodeum is absent entirely, there are numerous other recognized and classified conditions of abnormal rectal outlet; occasionally there is a total absence of any outlet, with the rectum or colon, as the case may be, suspended loosely in the pelvis.

It is not my purpose to other than mention malformations which are well outlined in many books; I should mention, however, that the junction of the proctodeum and hindgut when normally completed, affords the location known as the pectinate line, where we find abnormal crypts and hypertrophied papillae. Just above this line is the location of internal hemorrhoids which are always covered by mucous membrane, while just below the line is the anal canal which is lined with a modified epithelium. The differential diagnosis between internal and external hemorrhoids is made by the membrane which covers them—mucous membrane or skin.

The human embryo is provided with a tail and a portion of the gut—the postanal gut—which rapidly disappears before birth, comes down into

this tail. This location had obvious advantages presumably in a very early state of human evolution. It is an abnormal retention of the rudimentary postanal gut which explains the sacral-dermoid or pilonidal cyst. It is this cyst which usually becomes infected in which we find variable amounts of hair.

The heart of all the higher mammals in one stage of its development is found to be similar to the adult fish. The presence of gill clefts which normally disappear but occasionally are carried over to the life cycle seem to indicate that some remote ancestors breathed by gills instead of lungs. It is said that dimples which are considered a mark of great beauty in some individuals are a manifestation of undeveloped gill clefts. The yolksac and vitelline duct strongly indicate that we have descended from four-bears that laid eggs.

There is very definite evidence that we formerly walked on four legs when one considers the mal-suspension of the colon, and I may also mention the mal-suspension of the uterus and bladder; natural laws and gravity conformed in an earlier period. For better visualization, let us stand with our backs to one wall of a room and imagine the colon suspended by a membrane from the ceiling. In the left proximal corner we find the caecum, and as we proceed on the left side of the ceiling, we have the ascending colon as we approach the hepatic flexure. The transverse colon is suspended across the distal part of the ceiling, with the splenic flexure in the right distal corner, and as we travel back toward the right proximal corner, we observe the descending colon, iliac colon, and pelvic colon, recognized commonly as the sigmoid colon; then comes the rectum, and finally the anus, or muscular control of the bowel. There are two fixed points in this suspension, specifically the junction of the rectum and pelvic colon, and the junction of the pelvic colon and iliac colon. These two fixed points should be mentioned as pointing to the cause and treatment of prolapse of the rectum. If the meso-sigmoid is congenitally long and there is abnormal mobility of the fixed points—then those people may develop prolapse, otherwise it cannot occur. The

(Continued on Page 571)

*Especially written for the Proctologic number of THE JOURNAL-LANCET.

†Proctologist, Department Head, Detroit Receiving Hospital; Associate Proctologist, Harper Hospital; Consulting Proctologist in Charge, Grace Hospital; Associate Professor of Proctology, Detroit College of Medicine and Surgery; Extra-Mural Lecturer, University of Michigan.

Malignant Anal Lesions of Epithelial Origin*

Louis A. Buie, M.D., F.A.C.S.†

and

John C. M. Brust, M.D.‡

Rochester, Minn.

THE incidence of malignant lesions of the anus, as the incidence is represented by a review of the literature, varies within wide limits. Rosser stated that the frequency of anal carcinoma, as compared with that of carcinoma of the rectum and sigmoid, has been reported as varying from less than one per cent to ten per cent. Gant noted that five per cent of neoplasms of the anus, rectum and sigmoid were in the anus. Pack and Lynch have reported three per cent, and Rankin estimated the figure at two per cent after a study of 100 cases of carcinoma of the rectum and sigmoid. C. H. Mayo stated that six per cent of these lesions would be found to involve the anus, but he assumed that the anal canal extended $1\frac{1}{4}$ inch (3 cm.) up from the anal orifice.

The discrepancy in these figures is due chiefly to two factors. First, reports usually have been based on information gained from study of a small group of cases. Second, conceptions as to the boundaries of the anal canal have varied. It is probable that those who reported the higher percentages considered any lesion which grew so as to involve the anus to be an anal carcinoma, although the growth might have originated elsewhere. This, surely, is the explanation of C. H. Mayo's statement. In order to be sure of the accuracy of a report of this kind, certain factors should remain constant. In this review, therefore, we have included only those lesions which originated in the epithelium of the anal canal, and which might be considered primary tumors of the anus. The internal limit of the anal canal is established as that irregular margin of skin known as the pectinate line or linea dentata, formed during embryonic development by the union of the hind gut and the proctodeum.

From January, 1919, until July, 1932, fifty-one patients came to The Mayo Clinic with primary anal neoplasms. During the same period more than 61,000 patients have been examined proctoscopically. The incidence, therefore, of malignant lesions originating in the anus is

about 0.083 per cent of those cases in which patients presented complaints referable to the terminal portion of colon. In this group we found 2,939 malignant lesions on proctoscopic examination, by which procedure we usually explore the lowest 24 cm. of the colon. The incidence, then, of primary anal lesions as compared with the total number of carcinomas which can be discovered by this means is 1.73 per cent. All adenocarcinomatous tumors originating in the rectum and involving the anus secondarily have been excluded. Several hemangio-endotheliomas originating in the hemorrhoidal vessels adjacent to the anus were omitted. No malignant tumors of the pelvis or neighboring viscera, involving the anus secondarily, were included. Rarely can true squamous-cell epitheliomas be found above the anal canal. The origin of such unusual lesions may be explained on the theory that glandular epithelial regenerative cells can produce either protective (squamous) or secretory (glandular) epithelium. We have one case of adenocarcinoma of the anus which originated in a sweat gland.

It is interesting to compare the low incidence of the lesions considered in this paper with the frequent occurrence of carcinoma of the lip. This comparison is offered without any attempt to offer an explanation for the difference in incidence. During the ten years from 1920 to 1930, more than 1,300 patients with carcinoma of the lip came to The Mayo Clinic. This is particularly remarkable when the similarity of embryonic development and histologic structure of the oral and anal openings is considered.

Statistical values based on study of a small series are not only unsatisfactory but often misleading. We, therefore, present the results of this study with the full realization of the possible margin of error. In general, the age incidence parallels that of carcinoma of the rectum and sigmoid, with one notable exception. The youngest patient found to have anal epithelioma was aged thirty-six years. One patient was thirty-seven years of age, and another thirty-eight years. Forty-eight patients of the series of fifty-one (94 per cent), were more than forty-three years of age; thirty-four (66.6 per cent)

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were fifty years of age or older; and twenty (39.2 per cent) were more than sixty years of age. We know that neoplasms of the rectum and sigmoid have been found in children. Occasionally they are found during the second decade of life and often are seen during the third and fourth decades. In this group of cases, it will be observed, no lesions were found among patients who were in the first, second, third, or first half of the fourth decade of life.

Twenty-five of the patients were males, and twenty-six were females. This ratio does not correspond with that of the sex incidence of rectal carcinoma; 64 per cent of those afflicted with this condition are males.

SYMPTOMS AND SIGNS

A certain group of symptoms can be ascribed to a variety of rectal disorders. A patient's subjective complaints are of little assistance in determining the actual character of the underlying disease. For example, a patient with an obstructive lesion of the sigmoid may have troublesome frequency of defecation, characterized by the expulsion of numerous small, bloody stools; often, this is misleading. Many times, due either to inconvenience, to lack of proper facilities, or to poor care, patients have been treated empirically with tragic consequences. Patients with chronic ulcerative colitis, and many times those with stools laden with *Endamoeba histolytica*, have been known to be troubled with constipation. In general, it is not wise to rely on the patient's statement concerning the state of the bowels when attempting to make a differential diagnosis.

If anal lesions are present, error is not so likely to occur because in such cases the patient's discomfort is of paramount significance. It is well known that the rectum is not endowed with pain sense, and, as has previously been stated, because of this lesions involving the rectum do not manifest themselves until they have assumed such character or proportions that they either bleed or produce symptoms by involvement of the pelvic structures and produce discomfort. When lesions become obstructive it is usually late in the disease. A patient may feel ill for an undue period before consulting a physician, but there is one symptom which will bring a patient for early consultation, and that is pain. We, therefore, noted constantly that the patient with anal epithelioma consulted his physician soon after the trouble began, and our record of the duration of symptoms is probably quite accurate. The average duration of symptoms was eleven months, which closely approximates that in cases of malignancy of the rectum and sigmoid. The

symptom complained of was usually some form of discomfort, although the excruciating pain known to accompany acute anal fissure was not a regular feature. Itching seems to have been rather persistent, but we do not feel that it is necessarily of any significance and probably only due to the proximity of the lesion to the exterior and the constant moisture of the parts. In 19 per cent of the cases this combination was noted. Bleeding, pain, constipation, a sense of fullness in the perineum, anal discharge, itching, and frequency of defecation simulating diarrhea were the outstanding features in a review of the symptoms. Usually patients presented only a few of these evidences of disability, and there was little similarity in the stories as they were told. One patient might complain of itching and slight bleeding, whereas another patient, with an almost identical lesion, might describe the intractable type of pain which is usually associated with acute involvement of the anal ring. Only twelve patients complained of the severity of their discomfort. Bleeding was almost a constant factor, it was rarely profuse and invariably was blamed on hemorrhoids by the patient. Often the history revealed that during the earlier appearance of symptoms, the physician agreed with the patient's opinion. Loss of weight, when present, was rather marked and was usually seen in patients who had extension beyond the confines of the anus.

Some physicians may consider it singular that the well-known ribbon and-pencil stools have not been referred to by any of these patients. In a review of a large series of cases of carcinoma of the rectum and sigmoid, and also in a series of benign strictures of the rectum, we have found that this was not a characteristic sign. Few patients in the review mentioned deformity of the stool. As the anus is that part of the colon which has to do with the ultimate formation of the stools it might be thought that lesions involving this part of the bowel would change the shape of the stools. The absence of this characteristic can be explained by the fact that the patients have pain, and consequently take laxatives in order to soften the stool and thereby reduce the amount of their discomfort. It should be stated that we have seldom found deformity of stools associated with serious rectal or anal disease, and it is usually complained of by patients who are constipated, and who have chronic anal infection with either spasm or organic contraction. This type of patient is constantly fighting against what he calls "stoppage." Dilatation, diet, laxatives, and so forth have been his con-

stant companions. Therefore, such a patient has noted that the formed stools which he has been able to force through are smaller, and it is he who most frequently refers to ribbon and pencil stools.

We were surprised to note that in these cases, even as in cases of hidden carcinoma higher up, some procrastination was practiced. In the case of hidden carcinoma we have found that the patient postpones the examination first, and the physician has lost much time after the patient has reached him; in the case of malignancy of the anus, as has been stated, the patient has come for examination earlier, and on investigation it is found that for variable reasons the true nature of the disorder has usually remained undiscovered until examination at the clinic. The decision to change physicians often was due to the fact that the condition had not healed and the physician was "suspicious." In only a few cases was a specimen removed previous to the patient's arrival at the clinic and, therefore, the true nature of the disease often remained unknown. Proctoscopic examination has been carried out at the clinic on all of the fifty-one patients, and in forty-seven cases, the diagnosis was either frankly stated or suspected when the patient was referred for this examination by the clinician. In three cases malignancy was not considered until after the proctoscopic examination was done. In one case the patient was operated on by us for hemorrhoids, and during the microscopic examination, the malignant character of the tissue was discovered, thus justifying this routine procedure in connection with all rectal surgery.

An attempt to describe the gross appearance of epitheliomas of the anus would be of little value. There is no definite picture; neither the appearance nor the "feel" have any characteristics which may be considered constant. Many descriptions may be found in the literature. Gross appearance, situation, the type of tissue, the frequency and rapidity of lymphatic involvement, and the mode of extension have been described many times. There are many differences of opinion. The growth may be small, warty nodules just beneath the skin, or the lesion may be ulcerous. Some physicians have felt that the nodules come first and the ulcerative degeneration later. Other physicians believe that there are two different types, the nodular and the ulcerous. We have seen both, and, it has seemed that the appearance has been too variable to be classified. In the walls of the anus we have found

large nodular masses; small, nonulcerating, warty nodules; small ulcers, some having soft bases, some having cartilaginous bases; piled up edges; nonproliferative, irregular margins and even large annular, ulcerating and fungating masses. Biopsy has always been necessary in making a differential diagnosis. In two cases lesions believed to be benign (but suspicious) were excised, and were found to be malignant on microscopic examination. In twelve cases it was noted at the first examination that the inguinal lymph nodes were suspiciously enlarged. The posterior half of the anal wall seems to be more commonly involved by all lesions, and we have found no exception to this rule. The entire circumference of the anus was involved in two cases. Most of these patients appeared fairly healthy; only two were described as appearing wasted, and seven were noted to be actually obese. The average estimation of hemoglobin was 12.8 gm. for each 100 c.c. of blood, well within normal limits, especially when the age of the patients is considered.

ETIOLOGY

We do not attempt to deal with etiology because we feel that there is little that we can add to the very meager information and hypotheses which are generally propounded in relation to the source of malignancy. A careful search of the histories of these patients was made, however, in an attempt to establish the presence of any previous local change.

Of thirty-four patients, eight complained of fistula when they were admitted to the clinic, nineteen of hemorrhoids, one of kraurosis, two of anal warts, two of anal abscesses, one of anal ulcers or fissures and one of prolapse. These data seem to support the hypothesis that irritation is the cause of anal carcinoma.

Rosser has called attention to the relationship between benign anal lesions and the subsequent development of anal carcinoma. From a review of his cases he asserted that if irritation is to be accepted as a predisposing factor in the production of carcinoma, physicians must be more careful in their statements concerning the ultimate innocence of fissure, fistula, and hemorrhoids. To illustrate the differences of opinion, Rosser quoted Ewing, Yeomans and Pennington. They believed that preëxisting benign lesions were merely coincidental. We are not sure that Rosser is right, but regardless of our opinion on this matter, we believe that we assume definite responsibility when treating any lesion in the anus or rectum, and that this responsibility is relieved only after the true nature of the tissue has been

TABLE 1—SUMMARY OF CASES

Case	Age, Symptoms, and Admission, Sex	Duration of Symptoms, Before and Admission, Months	Clinical Features	Decision as to Operability	Microscopic Characteristics of Tissue	Treatment	Outcome
1	77 M	6	Malignant prostate; uremia.	No	Papillomatous mass 1 by 2 by 5 cm. involving the anal margin; epithelioma.	None for local lesion; suprapubic cystostomy.	Died 11 days after operation.
2	44 F	24	Small lesion; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 3.	Colostomy; surgical destruction by cautery.	Living 5 years after operation.
3	43 F	6	Infiltrated scar; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 2.	Local excision; roentgen-rays.	Living 6 years after operation.
4	62 M	3	Small lesion; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 3.	Wide excision; radium, 2 courses.	Living 1½ years after operation.
5	48 M	10	Lesion 3 by 4 cm.; incontinence; small inguinal nodes.	Yes (?)	Squamous cell epithelioma, graded 3.	Colostomy; posterior resection; colloidal lead and radium.	Died 2 years after operation.
6	46 F	6	Small growth.	Yes	Papillary adenocarcinoma.	Local excision; radium, 2 courses.	Living 1 year after operation.
7	37 M	10	Intensive growth; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 2.	Colostomy; roentgen-rays to groins; radium to anus.	Living 3 years after operation.
8	47 M	16	Previous operation elsewhere for carcinoma of anus; enlarged nodes.	No		Sent home.	Unknown.
9	38 M	12	Small growth; no enlarged nodes; 2 operations elsewhere.	Yes		Refused to take treatment.	Unknown.
10	66 F	12	Large lesion.	Yes	Squamous cell epithelioma, graded 2.	One stage Harrison-Cripps operation.	Living 5 years after operation.
11	52 F	13	Small growth; hemoglobin 53 per cent.	Yes (?)	Squamous cell epithelioma, graded 4.	Local excision; radium, repeated 2 years later for local recurrence.	Died 3 years after operation.
12	79 M	4 to 6	Senile arteriosclerosis; growth 7 cm. diameter.	Yes (?)	Squamous cell epithelioma, graded 3.	Local excision with cautery.	Living 2 years after operation.
13	65 M	8 to 10	Patient had 2 lesions; one: colloid carcinoma of rectum, graded 4.	No	Squamous cell epithelioma, graded 1.	Colostomy, palliative; radium at home.	Unknown.
14	68 F	4	Growth 3 by 2 cm.; poor risk.	Yes	Squamous cell epithelioma, graded 2.	Radium and cautery; colostomy and posterior resection.	Living 3 months after operation.
15	47 M	6		Yes	Squamous cell epithelioma, graded 1.	Wide local excision; radium.	Living 6 months after operation.
16	64 F	24	Obstructive mass, 2 by 2.5 cm.; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 3.	Radium for 1 week.	Unknown.
17	54 M	17	Annular fixed mass; inguinal nodes enlarged.	Yes	Squamous cell epithelioma, graded 3.	Colostomy; posterior resection.	Living 6 months after operation.
18	70 F	14	Poor condition; hypertension; large growth 5 by 7; poor risk.	Yes (?)	Squamous cell epithelioma, graded 1.	Radium, roentgen-rays.	Living 6 months after treatment but further extension of growth reported.
19	51 M	6	Fistulotomy 6 months before; lesion 4 by 6 cm.	No	Squamous cell epithelioma, graded 3.	Radium and roentgen-rays repeated in 8 and 14 months.	Living 1½ years after treatment; receiving palliative treatment.
20	65 F	6		Yes	Squamous cell epithelioma, graded 3.	Colostomy; posterior resection; radium.	Died of bronchopneumonia 4 months after operation.
21	44 M	3		Yes (?)	Melanoe epithelioma.	Wide excision; radium.	Died of pulmonary metastasis 1½ years after operation.
22	53 M	12		Yes	Squamous cell epithelioma, graded 1.	Had excision at his home.	Unknown.
23	71 F	4	Semility; large nodes; poor risk.	No	Squamous cell epithelioma, graded 3.	Extensive radium.	Living 3¼ years after treatment.
24	54 M	2	Arteriosclerosis; palpable small inguinal nodes.	Yes (?)	Squamous cell epithelioma, graded 4.	Colostomy; high iliac nodes involved posterior resection.	Died 1 year after operation.
25	59 M	18	Inguinal nodes enlarged.	Yes (?)	Squamous cell epithelioma, graded 2.	Wide local excision; radium; roentgen-rays to groins and lower abdomen; radium repeated in 2 years.	Living 4 years after operation, but pelvic metastasis reported (?).

26	64 M	12	Nodes in groin; obstructive growth.	No	Squamous cell epithelioma, graded 3.	Excision done because of obstruction.	Died 3 months after operation.
27	54 M	16	Previous radium treatment.	Yes (?)	Squamous cell epithelioma, graded 4.	One stage Kraske.	Died 1½ years after operation.
28	63 M	7	Lesion 3 cm. diameter.	Yes	Squamous cell epithelioma, graded 3.	Harrison-Cripps with cautery.	Living 7 years after operation.
29	46 F	1	Malignant extension to vagina; acute obstruction, metastatic.	No	Squamous cell epithelioma, graded 3.	Colostomy; radium; roentgen-rays.	Died 1¼ years after operation.
30	49 M	*		Yes (?)	Squamous cell epithelioma, graded 1.	Refused to undergo operation.	Died 1½ years after visit to clinic.
31	53 F	1	Annular lesion.	Yes	Basal cell epithelioma.	Colostomy; posterior resection; half of vagina removed; local nodes removed; radium.	Returned with recurrence in 8 months; died 9 months after operation.
32	64 M	Indefinite	Small lesion.	Yes	Squamous cell epithelioma, graded 1.	Excision.	Unknown.
33	58 F	5 Weeks	Small lesion; no enlarged nodes.	Yes	Squamous cell epithelioma, graded 3.	Harrison-Cripps operation.	Living 2¾ years after operation.
34	44 F	1		Yes	Squamous cell epithelioma, graded 2.	Excision.	Living 10 months after operation.
35	48 M	Indefinite		Yes	Squamous cell epithelioma, graded 2.	Cautery excision.	Living 5 months after operation.
36	58 F	10 Days	Hypertension (220); huge lesion of anus and perineum; inoperable.	No	Squamous cell epithelioma, graded 3.	Radium.	Died of carcinomatosis 10 months after treatment.
37	53 F	30	Hard node size of orange; left groin extensive mass.	No	Basal cell epithelioma.	Radium advised, went home.	Unknown.
38	50 F	Indefinite	Old fistula; bad risk because of general condition.	Yes	Squamous cell epithelioma, graded 2.	Hysterectomy; cautery excision.	Living 3 years after operation.
39	67 F	6		Yes	Squamous cell epithelioma, graded 3.	Colostomy; posterior resection.	Unknown.
40	60 M	42		Yes (?)	Squamous cell epithelioma, graded 3.	Radium and roentgen-rays; Harrison-Cripps operation.	1 year later colostomy and posterior resection and more radium; living 2½ years after operation.
41	70 F	6	Old fistula.	Yes	Squamous cell epithelioma, graded 2.	Wide excision; radium (2 months).	Unknown.
42	36 F	8	One hard right inguinal node at onset.	Yes (?)	Squamous cell epithelioma, graded 3.	Radium; cautery destruction; radium at 3 months intervals for 3 years.	Died of metastasis to liver 3¼ years after operation.
43	61 F	2 Weeks	Enlarged nodes.	Yes	Squamous cell epithelioma, graded 3.	Radium; cautery.	Living 2 months after operation.
44	49 F	Indefinite	No enlarged glands; large lesion.	Yes	Squamous cell epithelioma, graded 2.	Radium; 3 courses in 5 months.	Living 6 months after treatment.
45	76 F	12	Senile; fixed growth.	Yes (?)	Squamous cell epithelioma, graded 3.	Perineal resection.	Living 3 years after operation.
46	49 M	5	Enlarged nodes; perineal and anal involvement.	No	Squamous cell epithelioma, graded 2.	Radium and roentgen-rays over inguinal region.	Died 4 years after treatment; carcinoma reported to be progressing 3 months after treatment.
47	68 F	6	Senile; poor risk.	Yes (?)	Squamous cell epithelioma, graded 3.	Radium, local and over inguinal region; roentgen-rays.	Living 1½ years after treatment.
48	67 F	7	Hard inguinal nodes.	No	Squamous cell epithelioma, graded 3.	Radium for 2 months; further radium at home.	Living 3¼ years after treatment.
49	58 M	12	Inguinal nodes enlarged.	Yes	Squamous cell epithelioma, graded 3.	Local excision; radium; roentgen-rays to lower abdomen and groin.	Living 10 months after operation.
50	59 F	6	Fixed lesion; previous local excision.	No	Squamous cell epithelioma, graded 3.	Radium and roentgen-rays.	Living, but in poor condition 5 months after treatment.
51	45 M	Indefinite	Small lesion; no enlarged nodes.	Yes (?)	Squamous cell epithelioma, graded 4.	Refused to undergo operation; local excision by home physician; returned and received extensive radium and roentgen-rays 6 months later.	Died 1½ years after treatment.

*Long history of fistula, recent history indefinite.

determined by microscopic examination performed by a competent pathologist.

UNNECESSARY TREATMENT

It has been shown many times that unnecessary operative and nonoperative treatment has preceded the discovery of carcinoma of the rectum. Similarly, lesions have been unnecessarily treated which could easily be seen without instrumental exploration. How many of these operations were really indicated? How much delay has resulted? How much dissemination of malignant tissue was initiated? Reliable figures in answer to these questions are not obtainable.

Thirteen patients had undergone hemorrhoidectomy since onset of symptoms; three had undergone hemorrhoidectomy prior to onset of present symptoms; ten had undergone fistulectomy or had an abscess since onset of symptoms, and one had undergone fistulectomy prior to onset of present symptoms.

PATHOLOGY

From the pathologic records of the cases included in this study, it has been noted that a specimen was removed for biopsy at the time of proctoscopic examination in thirty-five of the fifty-one cases, and that microscopic section was made of specimens removed at operation in thirteen cases in which biopsy was not done. In three cases in which obviously involvement was hopeless and extension was wide, microscopic studies were not made. The pathologic findings in forty-eight specimens examined were as follows: forty-three were squamous-cell epitheliomas, three were basal-cell epitheliomas, one was a melano-epithelioma, and one was a colloid carcinoma which was believed to have originated in a peri-anal sweat gland.

Microscopic study of the forty-three squamous-cell epitheliomas was made to determine the grade of malignancy based on the method of Broders.

In six cases the growth was graded 1, in ten cases it was graded 2, in twenty-one cases it was graded 3, and in six cases it was graded 4. It is obvious that squamous-cell epithelioma of the anus is usually a lesion of a high grade of malignancy. This fact should be kept in mind when considering prognosis.

PROGNOSIS AND TREATMENT

It is always desirable in a study of this kind to make some definite statement concerning the mortality. This is true, both from the standpoint of those who have made the investigation and those who have read the article. However, a simple statement, giving a percentage of mortality

is often misleading, and many times it would have been better had no such attempt been made. In our series, for example, there were forty-two patients concerning whom the outcome is known following treatment. Fifteen of these patients had died, to the time of writing. It would hardly convey any information of value for us to state that the mortality in the series is 35.7 per cent, because of the twenty-seven patients who had survived, fourteen had lived less than eighteen months. On the other hand, one patient, seventy-seven years old, was admitted because of a carcinoma of the prostate gland and it was found, incidentally, that he had an anal epithelioma. This patient died eleven days following suprapubic cystostomy.

Four other patients had extensive local and adjacent involvement with the metastatic inguinal lymph nodes, and were considered beyond help when admitted. These four patients died following palliative treatment. Here is a situation which discredits our values. One of these patients lived fourteen months and another lived four years following extensive treatment with radium and roentgen rays in an attempt to stem the progress of the inoperable condition. When the latter patient died, it was stated that the carcinoma had been progressing.

In another operable case the treatment was local excision and radium. Two years later the condition recurred locally, and at the end of another year the patient died. This patient had a squamous-cell epithelioma, graded 4. Still another patient whose condition was operable lived two years after colostomy and posterior resection; treatment with radium and colloidal lead had been given and finally the patient succumbed.

Therefore, when patients die of the original disease after two, three and four years, we feel that little can be gained except in a general way by including those who are still living at the end of a year or a year and a half, when estimating the statistical values on mortality. Because we realize this difficulty, we feel it is necessary for us to publish a table of the entire series of cases (table 1.) We believe that a clearer idea of the true values will be obtained in this way.

There are a few points to which we would like to call especial attention. Eleven of the fifteen patients who died were between the ages of thirty-six and sixty years. Four of the fifteen patients had squamous-cell epitheliomas, graded 4; of six the grading was 3, and one patient had a melano-epithelioma, all highly malignant lesions. In twelve of the fifty-one cases the lesion was considered inoperable, and in thirteen operability

was considered questionable. The question of operability was based on three factors: (1) involvement of adjacent structures; (2) extension to adjacent lymph nodes, and (3) grade of malignancy. However, in no instance was a high grade of malignancy alone considered as a contraindication to operation. As a matter of fact, one patient with a lesion graded 4 lived three years after local excision, and radium was given as palliative treatment; another such patient lived a year.

Although our experience, like that of all other physicians who have given reports on the subject, has not been at all favorable, we feel that something can be done to improve this condition. The immediate response to treatment has so often appeared gratifying. Many times the local lesion has literally melted away under the influence of radium. In some inoperable cases, the patients have been treated by radium and roentgen rays, and life has been prolonged for several years. This means much, especially when it is considered that so many patients are more than sixty years of age. Twelve of the patients who lived three or more years were treated by some combination of the following methods: (1) radical resection following colostomy; (2) cautery operations, and (3) extensive treatment with radium and roentgen rays. The methods employed were usually a combination of the first and the third, or else the third method only was used.

The point of greatest significance, we believe, is that physicians must not be misled by the insignificant size and appearance of the lesion. Anal epitheliomas must be treated radically. The lesion, pelvic glands, and the perineal and inguinal lymph nodes must be destroyed. The method is largely a matter of choice. Some surgeons may prefer to make colonic stomas and perform radical excision of the lower part of the rectum, the anus, the pelvic fat and lymph nodes, and apply radium and roentgen rays to the perineal and inguinal lymph nodes. Other surgeons might prefer to use radium and roentgen rays alone. The latter preference is justified, provided the treatment is carried far enough. It is not sufficient to apply radium to the lesion and the inguinal lymph nodes. If, however, radium can be placed in the rectum so as to attack the pelvic lymph nodes, and applied directly to the perineal and inguinal lymph nodes, and deep roentgen treatment is used in addition, it is probable that the results may be gratifying.

THE EMBRYOLOGICAL AND EVOLUTIONARY MANIFESTATIONS IN ANO-RECTAL AND COLONIC DISEASE

(Continued from Page 564)

surgical treatment is to re-establish fixation. It is my belief that the sigmoid cannot be satisfactorily entered with the sigmoidoscope for any distance when these two fixed points are normal, which accounts for the occasional inability to satisfactorily perform sigmoidoscopy.

Now, let's figuratively turn the ceiling upon end, thereby creating a situation where the large bowel is suspended from the sidewall; this is exactly comparable to the present so-called normal suspension in the human. It should be unnecessary to go into detail in calling attention to the various difficulties engendered in this perpendicular suspension. When walking on four legs as represented by four legged animals, the colon is suspended as I believe nature or the creator intended it should be. Constipation, kinks, ptosis, and occasionally prolapse of the rectum in its various degrees should be easily visualized as a result of what may be termed abnormal suspension.

May I refer to the fundamental cause or the development of hemorrhoids as having a similar bearing on evolution. The blood supply of the rectum drains largely into the portal circulation. These veins are not fortified with check valves; physics teaches us that it is the height of a column of fluid rather than the diameter that occasions the foot-pound pressure at the base. In other words, when a child begins to walk he is susceptible to the development of the varicosities at the lower end of the rectum, which with their complications we recognize later as internal hemorrhoids. With this conception or understanding, it can be readily understood why the many precipitating or assigned causes, such as constipation, diarrhoea, being on ones feet all day, and sitting in an office chair daily enter into and confuse the laity, as well as the majority of medical men as to the cause of hemorrhoids; the large majority of humans develop hemorrhoids.

It has been stated that since the recorded history of man, that evolution has not improved the physical status. I believe this to be a logical conclusion. In closing may I quote that pagan philosopher and poet—Omar Khayyam.

"The Moving Finger writes; and, having writ,
Moves on; nor all thy Piety nor Wit
Shall lure it back to cancel half a Line,
Nor all thy Tears wash out a Word of it."

The Technique of Graded Combined-Abdominal Resection of the Recto-Sigmoid and Rectum*

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GRADED operation for the extirpation of cancers of the large bowel and rectum, have always appealed to me because of the belief that they may be accomplished more safely, and just as radically in a larger percentage of cases, than single-stage maneuvers. That this entails the dangers and discomforts incident to two laparotomies, I am well aware, and at the same time, I agree that sacrifice of the sphincteric mechanism of the rectum is objectionable, but it is necessary. It is necessary, not only to accomplish the radical removal of growths at the rectal-sigmoid juncture, but to accomplish a dissection of the gland-bearing tissues in juxtaposition to the growth, in any circumstance.

In selecting an operation for cancer of the rectum and recto-sigmoid, I feel that a plan to a block dissection is one of the vital problems, and consequently, in dealing with growths in this location, I have directed my attention toward the perfection of a technique which includes an inguinal stoma. The many efforts to save the rectal sphincter, and to avoid colostomy, I consider unimpressive when viewed in the light of ultimate end-results. Most cancers of the rectum occur at the juncture of the upper rectum with the sigmoid flexure of the colon; a location inaccessible for any type of offensive, save one which attacks both from above and below.

Some years ago I attempted to determine the exact location of the growth in 100 consecutive cases, considering the recto-sigmoid juncture as an anatomic structure, extending five cm. intra-peritoneally and five cm. extra-peritoneally. My observation was that 69 per cent of the rectal cancers occurred at the recto-sigmoid juncture; 29 per cent in the rectum proper, and more often in the ampullary portion than in the lower segment; and the remaining two per cent in the anal canal. The significance of these location figures is strongly apparent when one recalls that the lymphatic drainage of the anal canal is forward into the groin, while that of the rectum proper and recto-sigmoid, as has been shown by the brilliant work of Miles, extends in three direc-

tions, namely: downward, laterally, and upward. In addition to this, he has called attention to the intra-mural group of lymphatics which are contained in the wall of the bowel, and through which extension sometimes takes place. The upward zone of spread, Miles considers the most important, and since the lymphatics of the pelvic mesocolon are particularly likely to invasion, its removal is desirable. He says, "So often indeed, is it found to be the seat of metastatic deposit, that the removal of this structure in every operable case of cancer of the rectum is just as important as is thorough clearance of the axilla in breast cancers." Thoroughly in accord with these fundamental principles as laid down by Miles, I modified his operation by making a two-stage procedure out of it, in the belief that I could apply it to a larger percentage of cases which came under my care. I have accepted for this type of operation, not only the good risks, but the border line cases, and have been satisfied with the operative mortality and the immediate end-results. Whether or not the five-year cures will warrant the continuation of this procedure, I do not know, because my own cases are not that old yet.

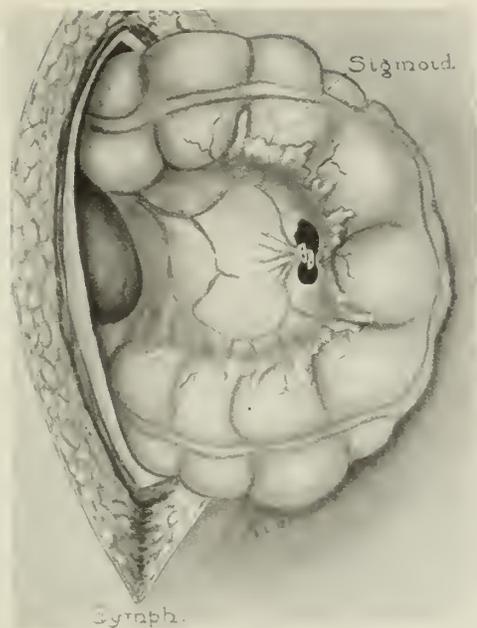
TECHNIQUE

First Stage—The first stage of the graded combined abdomino-perineal operation, consists of an abdominal search for metastases, and the establishment of a single-barrelled colostomy. That the exploration should be carried out in a routine manner, beginning with the upper abdomen, and exploring the growth last, is obvious.

The exploration is best made through a low mid-line incision, which need not be large, but only sufficiently roomy to admit the searching hand; and secondly, the manufacture of the colostomy, without interference. These wounds may be sealed off from the colostomy, and usually heal nicely.

On opening the peritoneum, the gloved hand is thrust upward to the liver, the surfaces of which are carefully palpated for metastatic nodules. Then the exploration proceeds from above, downward. The presence or absence of glands

*Especially written for the Proctologic number of THE JOURNAL-LANCET.



1. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. First stage. Abdomen is opened through a low mid-line incision, the sigmoid flexure brought out. Ligation of a single vessel in the mesentery of the sigmoid close to the bowel, wall. This allows inspection under the eye of the blood supply to both distal and proximal ends of the bowel.

around the pancreas and along the aorta is noted, as well as in the bifurcation of the common iliac arteries.

Lastly, the pelvis is explored for deposits on the pelvic peritoneum, and the growth is felt lightly and gingerly to test its mobility, and to estimate the chances of resecting it. One cannot emphasize too highly the necessity of gentle approach to the local growth, because of the infective organisms in the peri-colonic tissue.

It is a well established fact that the permeability of the large bowel to organisms, is hugely increased by two factors, namely, ulceration and obstruction. Both of these factors are almost always present in recto-sigmoidal growths, and vigorous manipulation at exploration may spread organisms in the peritoneal cavity with a resulting wide-spread infection.

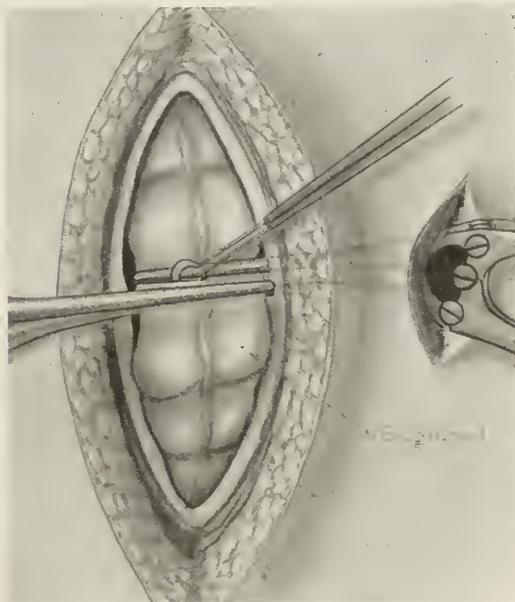
It is my considered opinion that peritonitis, which is the lethal factor in the majority of unsuccessful resections of the colon and rectum, more often follows spread of infective organisms by manipulation at exploration, or in the course of mobilization of the growth, than from failure of the suture line to hold.

If metastases are not demonstrated at exploration, and it is decided that the growth is resectable, a convenient portion of the sigmoid, that is, the highest point in the loop, is selected for the colostomy. The mesentery close to the bowel is

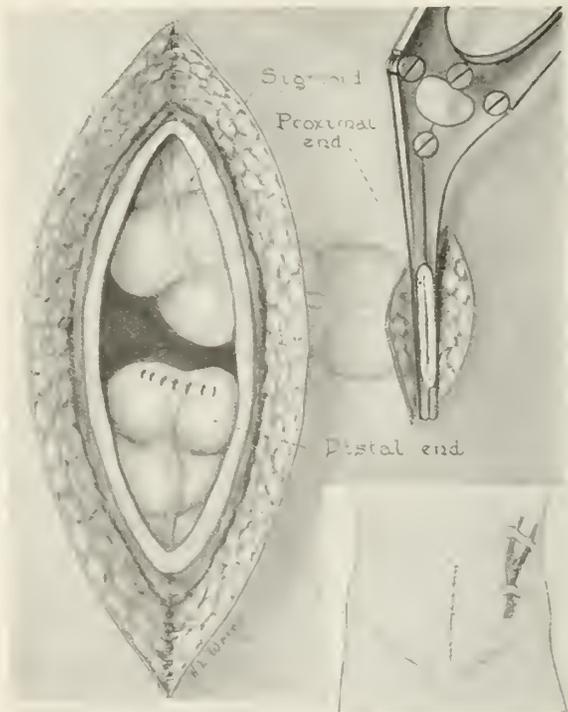
divided, but only sufficiently widely to permit the proximal end of the bowel to be drawn out through a stab wound in the groin; while the distal end is inverted and returned to the peritoneal cavity. The utmost care is taken to establish, under actual vision, that the blood supply to both ends of the bowel is not interfered with.

Steward and I have shown that the blood supply to the large bowel is very constantly and definitely distributed, although not so richly as that of the smaller intestine; so, unless the mesentery contains a great quantity of fat, it is easy to demonstrate the looping arches of the inferior mesenteric artery and to prevent unnecessary sacrifice of essential vessels.

The bowel is divided between two Payr clamps, the upper one of which has been thrust through a stab wound in the flank, selected as the site most satisfactory for taking care of a colostomy apparatus. The second clamp is approximated to this, but applied in the opposite direction, the bowel is then cut across with a cautery and the proximal end is drawn out, while the distal end is inverted and dropped back. The clamp on the proximal end completely obstructs the bowel, and is allowed to remain in situ for 48 to 72 hours. Men invariably tolerate this obstruction and gas accumulation, less readily than women. Sutures are not placed in the bowel wall to attach the colostomy to the peritoneum. The stab wound is made through the musculature of the abdominal wall,



2. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. First stage. The sigmoid is divided between Payr clamps. The proximal clamp is thrust through a stab wound in the left flank, and the clamp on the distal segment is applied in the opposite direction to it. The bowel is divided with a cautery.



3. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. First stage. The proximal end of the divided bowel is drawn out through the stab wound, and the distal end is turned in and dropped back. Insert shows abdominal wound closed, and clamp holding the proximal portion of the sigmoid. The clamp is to be removed at the end of 48 to 60 hours.

and is only sufficiently large to allow the bowel to be pulled out easily.

Two important points in establishing a colostomy, from the patient's standpoint, are the prevention of prolapse of the mucous membrane of the bowel, and herniation around the colostomy. If one may accomplish a single-barrelled colostomy without hernia or prolapse, and the individual establish correct bowel habits, so long as the stools are formed and the lower bowel emptied once, or at most, twice a day, little discomfort results therefrom.

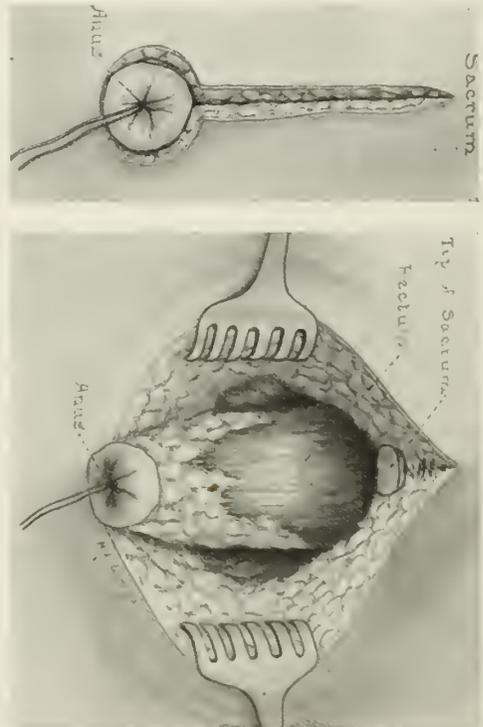
The question of not suturing the peritoneum of the bowel to the peritoneum of the abdominal wall, has, in my experience, justified itself. Without sutures, nature establishes a snug agglutination in the first 48 hours, and I have observed no tendency on the part of the loop to retract. It is questionable whether the mortality is higher in manufacturing colostomies of this type than in the ordinary loop colostomy, in which the bowel is not divided. My own mortality, including all types of colostomies, has been 3.5 per cent in operable cases, and twice that high in cases found inoperable for various reasons, but nevertheless explored.

Second Stage—The time for carrying out the

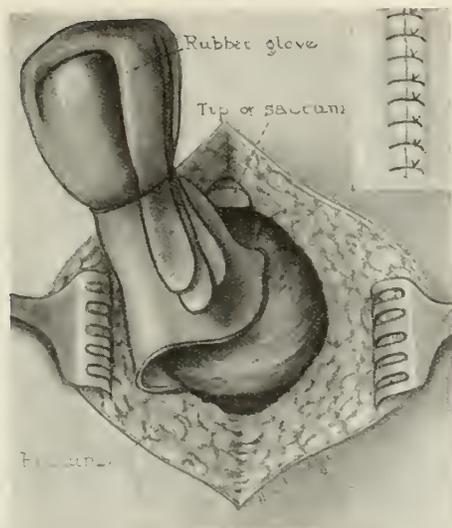
second stage of the combined maneuver varies, but usually a month to six weeks between stages will be considered the optimum period of waiting. The unpleasant objection that the cancer in the meantime may metastasize, cannot be avoided, but I think the fact that these people have known of bowel symptoms sometimes for a period of ten or more months before seeking advice, counterbalances this delay, if by so doing one may extend the scope of the operation. Between stages efforts are strenuously directed toward rehabilitation, as well as reduction of the infection around the local growth.

Rectal irrigations are instituted about the tenth post-operative day, and are continued daily up to the time of the second stage. A two-way rectal tube has proved a most satisfactory method of cleansing the bowel without exerting undue pressure on the inverted stump. Every effort at rehabilitation is urged. It has been my experience that these people improve rather quickly after the obstruction of the bowel is relieved, and efforts are made to build up their general strength.

The resection is done by beginning posteriorly, but finally ending up with an abdominal incision also. This posterior method of partial mobilization permits extensive dissection of the pelvis up



4. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. Second stage. Posterior approach. The anus is closed with a purse-string suture, and two lateral incisions encircle it, extending upward to the sacro-coccygeal articulation. Mobilization of the rectum is shown. The coccyx has been removed.



5. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. Second stage. The rectum has been completely mobilized up to the peritoneum, which has not been opened. It is encased in a rubber glove and thrust back into the hollow of the sacrum. Insert shows the wound closed.

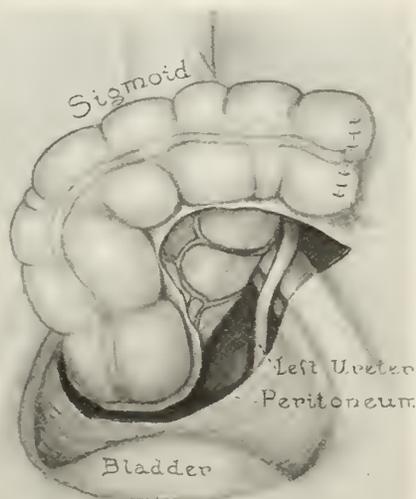
to the peritoneum. It is possible, thus without opening the peritoneal cavity, to clean out the hollow of the sacrum and ischio-rectal fossa, sacrificing the levator ani muscle and clearing away the gland-bearing tissues around the prostate gland and seminal vesicles in the male and from the posterior vaginal wall, cervix and broad ligaments in the female.

The patient is placed face downward on the table as for a posterior type of resection, with the hips elevated and the anus closed with a purse-string suture. The anus is encircled with two incisions which are carried up and joined a little above the sacro-coccygeal articulation. Undermining these incisions, it is possible to remove as much fat and gland-bearing tissue from the ischio-rectal fossa as is necessary, and at the same time, sacrifice a great portion of the levator ani muscle. The coccyx is disarticulated from the sacrum, and dividing the fascia propria opposite the sacro-coccygeal articulation, a blunt dissection of the hollow of the sacrum, follows. The lateral dissection is now carried completely up to the peritoneum, which is not opened. The rectum is now encased in a rubber glove, which is tied tightly around the cuff, and pushed back into the hollow of the sacrum, and the posterior wound closed. Up to now, the peritoneum has not been opened and the operation has been carried on under trans-sacral anaesthesia.

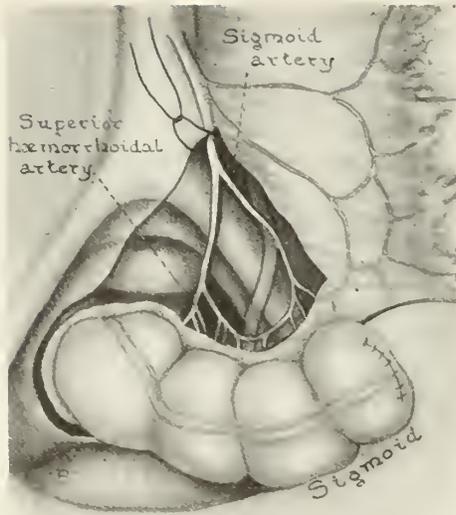
The patient is now turned on his back and the anterior part of the dissection carried out. The low mid-line incision which was used for explora-

tion is opened again and enlarged to extend from the symphysis to an inch above, and to the left of the umbilicus. No exploring is done. The pelvis is carefully packed off with wet sponges and the turned-in end of the bowel sought. The peritoneum over the inferior mesenteric vessels is incised, and both ureters identified. The left ureter runs close to the vessels, but the right one is well away from them. The inferior mesenteric vessels are now ligated close to their origin, and doubly ligated if there is much fat in the mesentery. Excepting only the middle sacral artery, the terminal branch of the aorta, practically all of the blood supply is thus tied. The incisions in the peritoneum are carried forward toward the base of the bladder on both sides, and the bladder is separated from the rectum. With gauze dissection the gland-bearing tissues on both sides of the bowel are wiped mesially, and the entire segment is lifted out through the abdomen. Peritonealization of the pelvis is quickly and easily made. There is no difficulty in peritonealizing the female pelvis because the broad ligaments and the uterus may be substituted for any defect left. In the male, with a little care in making the peritoneal flaps, one may also manufacture a new pelvic diaphragm with little effort.

The abdominal wound is closed, and drainage of the pelvis is made by opening the posterior wound and inserting a tube, and if necessary to control oozing, a small gauze pack. The large cavity made by the dissection, must obviously heal by granulation.



6. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. Second stage. Anterior approach. The peritoneum has been divided on either side of the mesentery. The blood supply in the mesentery, and the left ureter are exposed. The peritoneal attachment to the bladder has been divided.



7. Abdomino-Perineal Resection of the Rectum and Recto-Sigmoid. Second stage. Ligation of the inferior mesenteric vessels close to their origins.

The second stage of the operation is not usually difficult, and while it has the disadvantage of opening the abdomen twice in a short period, I feel that it not only utilizes the most satisfactory principles of a radical procedure, but at the same time extends the scope of the operation without increasing, and with a possible lowering of the immediate mortality.

POST-OPERATIVE TREATMENT

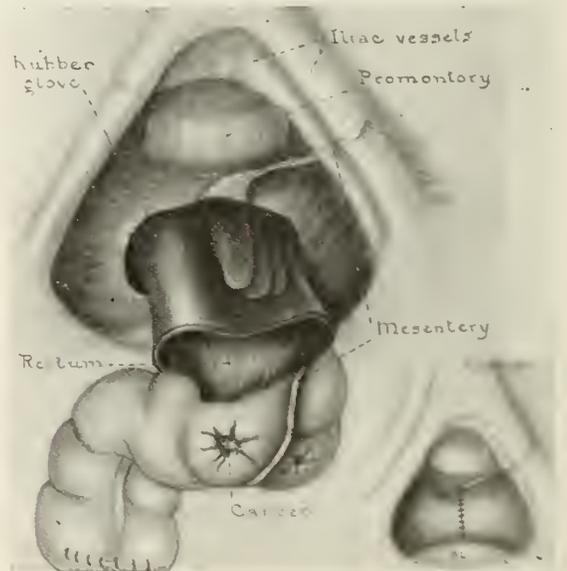
Post-operatively I have made it a rule to insist upon abstinence from fluids of any kind for 48 to 60 hours. During this time adequate amounts of narcotics are supplied to not only keep the patient comfortable, but also to quiet any peristaltic movements. I believe that a good test of the time to begin administration of food and fluid by mouth, is the passage of gas from the colostomy. Adequate hydration is accomplished by the administration of at least 3,000 to 4,000 cc of fluids by hypodermoclysis or venoclysis during each 24 hours. We have recently routinely instituted post-operative blood transfusions in all cases of bowel or rectal resections. It apparently has a most beneficial effect upon these cases, not only in reducing immediate post-operative reaction, but in promoting a smoother and less complicated convalescence. Complications are treated in a routine manner as they arise, with the exception of one, namely; parotitis, which seems to be much more likely to develop after an operation upon the large bowel and rectum than it does in the course of operation for other chronic lesions.

In a series of cases which I studied in 1930,

there was an incident of one case in each 135 operations on the colon and rectum which developed parotitis. This is nearly 17 times as many as the number encountered in general surgical cases. The use of radium applied as early as possible after the beginning of swelling appeared to be the treatment of choice, and not only did it avoid, in the majority of instances, incision of the parotid gland, but at the same time influenced most favorably the prognosis. The most important point in using radium, is to apply it early and in doses which consist of four applications, eight hours in duration, at intervals of eight hours, of four fifty-milligram tubes.

The care of the post-operative wound following the second stage of the procedure is of importance, and is best carried out by attendants who are accustomed to handling such cases. For the first 72 hours the wound is untouched except for changing the outside dressings. There will be a small amount of sero-sanguinous drainage, but not a great deal. At the end of 72 hours, it is desirable to remove the gauze pack and begin hot irrigations. The gauze pack is removed after carefully soaking it with peroxide of hydrogen, and pain may be done away with by the administration of some of the barbiturates. Two irrigations a day are generally employed, after removal of the pack, of either a physiological solution of sodium chloride, or a solution of potassium permanganate 1 to 5,000. Irrigations are also supplemented by heat from an arc

(Continued on Page 589)



8. Abdomino-Perineal Resection of the Recto-Sigmoid and Rectum. Second stage. Entire rectum being lifted out from the pelvis. Insert shows a new diaphragm has been made by suturing the pelvic peritoneum.

The One Stage Abdomino-Perineal Operation for Carcinoma of the Rectum*

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MANY considerations enter into the development of a surgical procedure aimed at the eradication of malignant disease of the rectum. First to be considered is the age and general condition of the patient, second, the extent of the process, next, the hospital facilities and lastly, the ability and experience of the surgeon. As a general rule the surgeon should do the type of operation in which he is most adept and for which the facilities at hand are most adequate. However, if this rule were too strictly adhered to, it is quite evident that surgeons would adopt an attitude of *laissez faire* and would not extend themselves to accomplish improvements in technic. This is well exemplified when one reviews the history of the various surgical procedures applied to carcinoma of the rectum. In its evolution, of course, developments in anesthesia, bacteriology, physiology and chemistry, as well as improved hospital facilities, have further aided the surgeon in accomplishing a great deal for the unfortunate patient with cancer.

I shall discuss here only the one-stage, combined abdominal perineal operation, whose chief protagonist, of course, is Miles of London. He was led to believe in the superiority of this procedure after a long experience with all types of operations and extensive study on the mode of extension and sites of recurrence following operation. Operations for cancer in any location necessitate thorough knowledge of the lymphatic system, and this is especially true so far as the rectum is concerned. Miles has given us the most lucid description of the lymph nodes in the rectal area.

Advocacy of any new procedure must be defended by thorough knowledge of fundamental principles, but space does not permit here any lengthy discussion of the relative merits of the one-stage or two-stage operation, except to point out that in the final analysis the only argument in favor of the two-stage operation is the lower rate of operative mortality. It should be pointed out, however, that if a surgeon has 100 patients, he is really performing 200 operations and no surgeon is lucky enough to be immune from accidents beyond his control. Furthermore, mor-

tality from the two-stage operation is quoted only after the second stage is completed, so that if the patient dies from the colostomy operation, this is not reckoned in the statistics because he has never reached the second stage of the operation. The mortality of colostomy averages four to five per cent; if this number were added to the statistics of mortality after the second stage operation where it rightly belongs if the two operations are to be compared on a fair basis, it is my feeling that the rate of mortality for the one-stage and the two-stage operations will be approximately equal.

An appropriate analogy, it seems to me, can be drawn from the field of thyroid surgery. Ten years ago, thyroidectomy for hyperthyroidism was a two, three or four-stage procedure, the vessels were ligated first and the patient returned in two or three months for operation. Now with the use of Lugol's solution, the patient is prepared for operation in about ten days and the operation is done in one stage with an even lower mortality than previously.

So with the one-stage operation, the largest individual factor is preoperative treatment which is so essential to its success, yet so little attention is paid to it. If the medical management is carried out thoroughly it will accomplish as much in preparation of a patient as will colostomy.

After the diagnosis of cancer of the rectum has been made, a thorough physical examination, of course, is essential. This is just as important as it is to have the physician do a digital examination of the rectum. A thorough search must be made for metastases and in a certain number of cases these can be seen (by the cachectic appearance of the patient) before they are felt. I believe that with the more widespread use of intravenous dyes, liver metastasis can be discovered in many instances thus saving the patients so affected from the ordeal of exploratory operation. If no contraindication to operation is found, the patient is hospitalized and preparation is begun.

Most of these patients have had more or less chronic obstruction for weeks or months and a drastic cathartic is contraindicated. I advise magnesium sulphate, one ounce of crystals in eight ounces of water, the patient to take one-

*Especially written for the Proctologic number of THE JOURNAL-LANCET.

half ounce of the mixture every half hour. This is repeated each day up to the day before operation. Magnesium salts are slightly irritating and cause fluidity of the stools by non-absorption of water. They also stimulate peristalsis and make an ideal laxative for these patients. In addition, enemas are given each day. After three or four days of this routine the distended abdomen frequently become scaphoid. Lately in addition to the above measures, pitressin has been used with gratifying results. In order to make up the loss of water by the intestine the patient is encouraged to drink large amounts of orange juice, lemonade and water, and if necessary, hypodermoclysis is administered.

Because for many weeks, the patient's appetite has been poor, it is likely that a considerable portion of the glycogen reserve in the liver has been exhausted. Hence 500 c. c. of a 10 per cent solution of glucose is injected intravenously each day. The patient takes a high-caloride, non-residue diet. During his stay in the hospital the kidneys are investigated and estimation of the urea clearance is made. Because of the age of many of these patients, there is an associated hypertrophy of the prostate, with obstruction and retention and consequent damage to the kidneys. Several patients in my series of cases have had to have punch operation of the prostate after recovery from rectal resection. Overlooking a condition like this may readily prove disastrous, and if a condition exists, the patient should have catheter drainage similar to the treatment preliminary to prostatectomy.

The impoverished myocardium usually improves with the increased glucose intake, but in case it does not, digitalis may be given for several days before the operation. During these preoperative days attention is given also to mouth hygiene. If the patient's hemoglobin or red blood cell count is low, a transfusion is given before, as well as after, operation; if the blood count is normal, the transfusion is withheld until after the operation in order to combat shock. Obviously the routine is entirely different from that in vogue not so many years ago, when the patient was brought into the hospital one night, given a dose of castor oil and operated upon the next morning.

After the patient has been well prepared for operation, anesthesia is the next important consideration. From my experience spinal anesthesia is to be preferred, for its advantages far outweigh any disadvantages it may have. The relaxation and quiet abdomen are conducive to a more rapid performance of the operation and the fact

that the anesthesia lasts only about an hour and a half is further stimulus to the surgeon to have things well planned and not to loiter, a habit too easily acquired if the patient is deeply anesthetized. There is not much choice in preparations used for spinal anesthesia today. In my experience, 150 to 200 mg. of Pitkin's solution has been used successfully in more than 3,000 operations. Meticulous care is taken to observe the blood pressure, although many observers say it will always come back to normal even after marked depression. This may be true but the complications in the succeeding few days, it seems to me, have a direct relation to that insult at operation. The use of ephedrine has been boosted and condemned. Increasing the blood pressure as it does by increased cardiac output may be of doubtful value because the drop in blood pressure is caused by vasomotor paralysis. At present I resort to the use of epinephrin only when the patient's systolic blood pressure falls below 80. The argument that the action of epinephrin lasts only for a short time is not tenable, for the operation itself lasts only a short time. With a few injections of one-half c. c. of epinephrin from time to time its effect will last until the anesthesia has disappeared.

As soon as the anesthetic has reached the level of the umbilicus, the patient is placed in the Trendelenburg position and prepared for operation. A long midline or left rectus incision is made and the liver is examined for metastatic involvement. Multiple nodules preclude operation; a small solitary nodule may not contraindicate operation for in such a case the patient may live two or three years and is much more comfortable if the primary growth is removed. The pelvis is then examined as to fixation or extension of the growth to the bladder or pelvic peritoneum.

If there is no contraindication to operation the first step is to incise the peritoneum on the lateral wall of the sigmoid at about the level of the pelvic brim. This fold is quite variable but it is usually necessary to incise it in order to mobilize the sigmoid. Then the inferior mesenteric artery is identified; the Cameron light is very useful for this purpose except when there is considerable fat in the mesentery. In the latter case, the artery generally is situated in the mesentery about two inches below the bifurcation of the aorta. This is tied just below the point where the first sigmoid branch emerges, it is necessary to preserve this for the blood supply of the sigmoid. Isolation and ligation of this artery saves a lot of time which otherwise would be consumed in cutting

and tying down vessels throughout the length of the mesentery. Then the peritoneum is incised on each side of the mesosigmoid down to the floor of the pelvis, anteriorly to the rectovesical pouch in the male or the pouch of Douglass in the female. The next step is to place the hand at the promontory of the sacrum and to separate all the fat from the hollow of the sacrum and push it forward. This dissection is carried down until the coccyx is felt. Attention is then directed to freeing the intestine anteriorly. A wide ribbon retraction is placed behind the bladder and with a long blunt scissors the dissection is carried down till the seminal vesicles are recognized. These are then pushed forward until the prostate can be felt, or, in the female patient, until the vagina is seen.

With the anterior and posterior dissection complete, traction on the bowel renders prominent the rectal stalks which support the rectum and these are divided as far laterally as possible; on the completeness of this dissection depends to a great extent the patient's curability and also the ease of the next step, posterior resection. This is done by dividing the bowel and the point of election depends on the redundancy or brevity of the sigmoid, if it is long, it is divided at a convenient point and brought out through the original abdominal incision for the permanent colostomy; if it is short it is brought out through a left McBurney incision. The bowel is divided by cautery between two crushing clamps and is tied with a heavy suture. Over each end is placed a piece of rubber dam which, again, is tied over the bowel. This saves time and prevents contamination by trying to invert the ends by purse strings sutures. The distal loop is then placed in the pelvis and the pelvic floor is reconstructed. This reconstruction is made from the flaps of peritoneum from the sides and floor of the pelvis and the posterosuperior surface of the bladder. If an opening remains it is repaired by placing an omental graft over the hiatus. This seldom is necessary. After closure of the incision with the colostomy either in the midline or left iliac region, the abdominal part of the operation is complete.

The patient is then placed on his abdomen in

the Kraske position. A purse string suture is placed around the anus and an incision is made in the mid line from mid sacrum down to encircling the anus. If the growth is low, a good portion of perianal skin must be taken. The skin flaps are dissected laterally until the gluteus maximus is seen. The coccyx is then disarticulated at the sacrococcygeal joint and the pelvic cavity containing the dissected colon is entered. The rectum is next dissected from above downward. The prostate or vaginal wall is in plain view and after the levator ani are incised (as far laterally as possible) removal, including the fat in the ischiorectal space, may be quickly accomplished.

There remains a large cavity surrounded only by the bladder in front and the bony wall of the pelvis. A large rubber square is placed into the cavity and this is packed with gauze to stop the oozing and to help support the new pelvic floor. The incision is then closed except for a distance of two inches, where the drain is situated. The gauze is partly removed on the second, third or fourth day and the cavity is irrigated daily with solutions of sodium chloride or boric acid or a 1 to 8000 solution of bichloride of mercury. After this the patient is put to bed and a blood transfusion of 500 c. c. of blood is administered.

Post-operative treatment then is symptomatic. The colostomy is opened on the second, third or fourth day, depending on the degree of abdominal distension. The patient receives a full diet as soon as the colostomy is opened.

If there are no contraindications, the patient is encouraged to get out of bed on about the twelfth to fourteenth day after operation. This helps to make the new pelvic floor sag, thereby hastening the filling of the large cavity. Before the patient returns home, he is instructed regarding irrigation of the colostomy and other general care.

I believe, that properly planned and executed, this operation offers the best hope of cure of cancer of the rectum. The operative mortality rate in 104 cases is 12 per cent. The percentage of patients with five-year immunity from carcinoma, is 40; with three-year immunity, 57 per cent and 64 per cent of this group have been well for less than three years.



The Rectal Cancer Problem, With Special Reference to the Use of Roentgen and Radium Rays*

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THE family physician occupies a paramount position for improving the results in the treatment of rectal cancer. He is usually the first to be consulted, and frequently in the early course of the disease while the patient still considers his symptoms to be due to hemorrhoids, indigestion, or some other non-serious ailment. If familiar with the physical findings of neoplasms in this area, the general practitioner is able, not only to make an early diagnosis, but also, because of his knowledge of the physical condition of his patients, advise regarding appropriate treatment. The average physician may see comparatively few cases of rectal cancer during active practice, nevertheless, as observed in a cancer clinic, this is a very common disease. Early recognition, or recognition before the disease has extended to other locations, is essential for complete eradication. Patients who have reached the more advanced stages can be benefitted merely to a lesser degree by palliative procedures.

Symptoms suggesting early neoplastic disease in this location are insidious in onset and of an indefinite nature. The two most worthy of mention consist (1) of alteration from the normal type of bowel action. This change may be in the form of constipation, increased constipation, lessening of constipation, or an attack of diarrhea. A recognizable degree of gaseous distention, most marked in the caecum and ascending colon, is usually an associated symptom. Sometimes the character and the consistency of the stools are changed. Diagnosis in a recent patient was reached by the simple complaint that the consistency of the stool had changed in the last three months. (2) The second outstanding early symptom is the presence of blood. This may be noticed as bright red on the stool or toilet paper, or as dark blood mixed with mucus, expelled at the time of stooling. Pain is not an early symptom, but discomfort across the lower abdomen and sacrum is not uncommon. Typical textbook symptoms, such as irregularity of the bowels, tenesmus, constant diarrhea, blood, pus, and mucus, lack of control, urinary disturbances,

severe pain, loss of weight and strength, etc., are present only after the disease is well established and the tumor has become a sloughing mass.

Experience has proven that a definite diagnosis of early rectal neoplasm cannot be made from the symptoms alone. Symptoms associated with the early stages of the disease are commonly encountered in many non-malignant conditions of the colon and rectum. Such symptoms, although they may at times be suggestive of one particular disease, should always be interpreted, until proven otherwise, as indicating the presence of unknown pathology rather than any particular disease. It is only by careful rectal examination that the cause of rectal symptoms can be ascertained.

Rectal examination consists of inspection of the external parts, palpation of the anal canal and lower rectum, and inspection of the anal canal, rectum, and lower sigmoid by the aid of suitable instruments. Histological study of a biopsy may be necessary to determine the exact character of the tumor. Roentgen ray examination, in the form of barium enemas for tumors of the rectum, should be discouraged, as small tumors are seldom recognizable by this method. Due to the indefiniteness of these early symptoms and the importance of recognizing this disease in its early stages, rectal examinations should form a part of the general physical examination of all patients suffering from the symptoms above noted or from any other which attracts the attention of either patient or clinician to this section of the anatomy.

Diagnosis is the first and easiest step of the rectal cancer problem. Selection and administration of treatment require greater consideration and a more detailed knowledge of the disease. Appropriate treatment can best be outlined when the following factors are considered: First, ability of the patient to withstand treatment; this factor can largely be determined from the age, amount of obesity, and chronic, constitutional ailments. Second, location and accessibility of the tumor. Tumors located at the recto-sigmoidal juncture may require different surgical procedures than those situated just above the anal canal. Tumors accessible for interstitial irradiation may be

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treated by this method rather than by surgical removal. Third, extent of the local involvement. Tumors that have infiltrated adjacent structures, to the degree of producing pain, can seldom be eradicated. Metastases of the liver and distal metastases contra-indicate radical methods. Fourth, the degree of infection, grade of malignancy, and radio sensitivity of the cancer cells. Tumors that are deeply infected are seldom favorable, as the disease, in most instances, has invaded the lymph channels. There are four recognizable grades of malignancy: grades one and two are comparatively favorable; grade three less so; while grade four is practically always fatal. The degree of radio-sensitivity greatly influences the possibilities of radiation therapy.

Treatment of rectal cancer is a surgical problem. It includes radical surgical removal, colostomy, and the use of radium and Roentgen rays. Surgical removal, first accomplished by Lisfranc over a century ago, became the method of choice after Kraske described his operation in 1885. Since then a marked improvement in surgical technique has taken place; today we have two recognized methods of approach, namely the perineal and the abdominal perineal. Each method, with variations in technique, is favored by different surgeons, and each method has its advantages and limitations. Because of the inability of radical surgery to cure a large percentage of the cases, and because of the limitation of palliation afforded by colostomy and other less radical procedures, the use of radium was attempted in this disease by Janeway in 1920. His use of glass filtered radon seeds placed in the tumor greatly stimulated the use of radium in this field. The advancement which has taken place in the entire field of radiation therapy since 1920 has placed this method instituted by Janeway, in an important position in the treatment of rectal cancer.

Patients may be separated as to treatment and prognosis, into favorable and unfavorable groups in accordance with the variations of the factors presented at the time a definite diagnosis is determined. This classification of favorable and unfavorable appears more appropriate than the surgical classification of operable and inoperable groups. All operable cases are not favorable, nor are all inoperable cases unfavorable. Favorable cases lend themselves to radical forms of treatment, and present possibilities of being completely relieved of disease or provided with a high degree of palliation. The highest degree of palliation for the unfavorable group usually is obtained by non-radical procedures. Regardless of the classification employed, treatment must be

selective. Each case represents an individual problem.

A favorable case may be treated by one of the following methods: (1) One stage abdomino-perineal, Miles type of operation; (2) one of the two stage abdominal perineal types of procedure; (3) perineal resection preceded by a colostomy; (4) perineal resection without a colostomy; (5) radiation therapy alone; (6) radiation therapy combined with any one of the above surgical procedures. All these methods of procedure are valuable in the treatment of the disease; however, only those dealing with radiation therapy and colostomy will be considered in this communication.

Irradiation therapy. I. The use of radium and Roentgen rays as a method of treating *favorable and operable rectal cancers* is receiving greater consideration in most cancer clinics. This method, like surgical technique, is selective. In a fair percentage of cases it is capable of producing clinical cures equal in permanency to those provided by radical surgery. Tumors selected for radiation therapy should either lend themselves to adequate, interstitial irradiation, or should be of the radio-sensitive type which disappears after external irradiation alone. The majority of tumors are sufficiently radio-resistant to require both external and interstitial radiation for eradication.

The period of convalescence varies. It may be either shorter or longer than that following radical surgery. The outstanding features of the methods which influence patients, are the avoidance of an artificial anus and the dangers and inconveniences of radical surgery. Colostomy is required only in those cases with a high degree of obstruction; Other cases retain a normal or practically normal functioning terminal intestinal tract.

II. The combined use of radiation therapy and radical surgery is also a step forward in the treatment of cancer. This method is most suitable for that large group of cases in which the disease, although fairly well established, would be treated in a radical manner. The final results of surgical removal under these circumstances, regardless of the type of operation, are far from satisfactory. Moreover, the possibilities of radiation therapy alone in this stage of the disease are not always encouraging. Combination of two methods, each of which is capable of producing clinical cures in properly selected cases, should bring about additional clinical cures and a greater degree of palliation than when either method is employed separately. The object of the combined

treatment is to use radium and Roentgen rays to destroy the malignant cells, especially those that have infiltrated beyond rectal wall and cannot be surgically removed, and then to remove as much as possible of the condemned tissue with surgery. Removal of condemned tissue prevents the undesirable reaction which might be expected to follow massive dosage with radium. The difficulty of surgical procedure is not increased by pre-operative irradiation, nor is the mortality increased. In a recent review of a series of cases treated at Memorial Hospital by Roentgen ray, colostomy, and perineal resection the operative mortality was below five per cent.

III. *Unfavorable rectal cancer* presents a less encouraging problem, but one that is worthy of careful consideration. The uninterrupted course of the disease averages about two years and is accompanied in the later stages by a very distressing group of symptoms. The object of palliative treatment is to lessen their severity and make patients more comfortable, and, when possible to prolong life.

Palliative procedures consist of colostomy, radiation therapy, and partial removal. Radical surgery which is capable of removing only a part of the disease, should be employed in comparatively few instances. The mortality in these cases is high. The ultimate result in those who survive seldom compensates for the dangers and inconveniences to which they have been subjected. In many instances the distressing symptoms, for which the operation was undertaken, are relieved but little. Intensive radiation therapy likewise, is not advisable in this type of case, as similar unfavorable results are liable to follow the use of large improperly calculated doses of radium.

Colostomy (or short circuiting the fecal stream) relieves obstruction, decreases the degree of infection and ulceration, and makes the patients more comfortable. However, an artificial anus is no longer necessary in all advanced cases and should not be employed routinely. Unless obstruction is a troublesome factor, nothing is to be gained by this procedure when radiation therapy is employed. The annoyance and inconvenience of an artificial anus in a debilitated patient without obstruction, only adds to the already existing burden. In the face of complete obstruction, or partial obstruction which cannot be controlled by diet or medication, an artificial anus should be constructed at once.

Radiation therapy of rectal cancer usually consists of external and interstitial applications. Dosage and technique of application differ considerably in the favorable and unfavorable

groups. Because of this variation, treatment of the two groups will be considered separately.

Favorable group: The first step of treatment here consists of external applications of radium and Roentgen rays administered about the pelvis at seven portals of entry. Roentgen machines are focussed at 50-70 cm. target distance, while the radium pack, which contains 4 grams. of radium is employed at 15 cm. from the skin. External treatments are given daily. The maximum skin dosage is delivered to each portal during a period of about three weeks.

There is an advantage in using both types of rays in external treatments. Roentgen rays are easily obtainable and administered; a large dosage may be delivered in a comparatively short time; these rays, however, do not appear to exert quite the same destructive effect upon the cancer cell as do the shorter rays of radium. The limited amount of available radium, however, prevents administration of the maximum skin dosage to seven portals within a period of three weeks, when the applicator is used at 15cm. from the skin.

While the dosage of irradiation delivered to the tumor by external applications is seldom sufficient to produce a complete eradication of disease, the effects, are nevertheless, quite marked. Bleeding stops, excess mucus is no longer seen, ulceration disappears, the tumor decreases in size and is more easily defined; many patients gain in weight and strength.

About two weeks after completion of the external treatments (a time sufficient to allow the above favorable effects to be manifested), the deficiency of the external dosage is supplemented by implanting gold filtered radon seed into the remaining tumor tissue. Seeds of one to three millicuries are employed, with their strength determined by the thickness of the growth and its radio resistant qualities. Adequate dosage to divitalize all malignant cells is essential. Seeds are inserted usually by direct vision through a proctoscope with long trochar needles. Details, such as total dosage, strength of seeds, and distribution of seeds are factors of the utmost importance. Should a colostomy be required because of obstruction, it is best constructed either before radiation therapy is commenced or during the interval between external and internal applications. Radiation therapy of the favorable case is outlined at the beginning and carried out in routine fashion; in other words, it is comparable to a surgical operation in that a real effort is made to eradicate the disease.

Unfavorable group: Treatment of unfavorable

or advanced cases differs in many respects from that described for the favorable group. The objective is palliation and not cure. In this group external irradiation, which consists of radium and Roentgen rays, is suitable for all cases and is employed as the first step of treatment. Total initial dosage will vary from 50 to 90 per cent of that usually given in a favorable case. The reason for limiting the dosage is the poor physical condition of the patient and the desire not to damage the skin thereby making subsequent external applications impossible. Patients with advanced disease may live for a considerable period of time and require during this interval several courses of external treatment. The average period over which the effects of treatment can be recognized varies from three to six months.

Interstitial irradiation as a means of supplementing dosage of external irradiation is employed only in those cases in which rather a high degree of palliation appears possible. Interstitial, like external, treatment may require repeating during the course of disease. The initial dosage is comparatively small and not sufficient for complete devitalization of the whole tumor mass. Seeds employed range from one to one and one-half millicuries each. Small dosages are capable of holding the disease in check without producing untoward reactions.

Both the patient and the physician are always interested in what reaction may be expected to follow the use of radium and Roentgen ray. This largely depends upon physical condition, intervals between treatments, dosage employed, location and degree of infection of the tumor, and the variable factor of idiosyncrasy to the physical agents. Reaction following external applications in a patient in good physical condition is practically nil; the poorer the physical condition, the greater the reaction. Appropriate dosage of external irradiation causes but little upset; there may be slight loss of appetite, general malaise, mild degree of nausea, or a slight increase in the amount of mucus. Such symptoms can be decreased and largely avoided by extending the period between treatments and limiting dosage; at most they disappear a few days after completion of the last treatment.

A moderate reaction may be expected to follow large dosage of interstitial irradiation; although some patients have almost none. Such reactions, when occurring, are characterized by increasing desire to evacuate the bowels, more mucus, feelings of pressure in the pelvis, distress in the anal canal, loss of appetite and general malaise.

These symptoms may be lessened and relieved by plenty of food, daily evacuations and a little codeine. With the proper selection of dosage, only a moderate percentage of patients will be confined to the house during convalescence. Many are able to continue their daily routine. Severe reactions are rare, and are usually due to improper dosage or ineffective technique.

Results following the use of radium and Roentgen rays are encouraging. They demonstrate that this method of therapy is capable of producing clinical cures in selected, favorable cases, and of providing greater palliation to the unfavorable case than is any other present day method of treatment.

The above fundamental principals of treatment, namely selection of cases and selection of treatment, have been followed at the Memorial Hospital clinic for more than a decade. Favorable cases are treated variously by (1) radical surgery, (2) radical surgery plus radiation therapy, (3) radiation therapy and colostomy, and (4) by radiation therapy alone. The unfavorable group is similarly treated by (1) radiation therapy, (2) radiation therapy and colostomy, and (3) in a few cases by radiation therapy, colostomy and partial removal. The principal feature of radiation therapy has been that of external application, followed by interstitial application when the latter is advisable. Dosage, filtration, and technique of application have been improved upon from time to time.

To illustrate our results, cases treated by radiation therapy alone and by radiation therapy plus colostomy during the years 1926-1930, inclusive, are here reviewed. Among the patients treated by these methods in this period, we have been able to follow 238 cases. Twenty-five were considered favorable and 213 unfavorable. Palliation of the unfavorable group will be classified as A, B, C, and D. In the A type symptoms were greatly reduced and often disappeared for a period of several months at a time. B palliation, patients were greatly relieved of their symptoms. C palliation represents only a moderate regression, while the patients in the D class appeared unbenefitted by treatment. Of the 213 unfavorable cases, 92 were classified as A, 63 as B, 40 as receiving C degrees of palliation, while 18 did not appear to receive any recognizable benefit. The majority of these patients were in the terminal stages, unfavorable and inoperable. Regression of symptoms does not always imply extension of life. Of the 213 patients studied, 183 lived over six months, 112

(Continued on Page 589)

Hemorrhoids*

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HEMORRHOIDS or piles (a synonymous term) are varicose tumors tying in the anal canal with a tendency to prolapse from the anal orifice and to bleed.

ETIOLOGY

The cause of the swelling of the veins of the lower rectum which produces this tumefaction has been variously ascribed to constipation, sedentary habits, liver stasis or cirrhosis, poor local hygiene and to a multitude of additional factors. My own observations would suggest that the agents named have little etiologic influence, although varicosity already present is no doubt influenced adversely by any of them.

The most plausible explanations which have been offered are *anatomic* and *inflammatory*. Mummery and others have argued that in the erect posture there is a column of blood from the anal canal to the liver which is unsupported by valves and insufficiently supported by adjacent musculature and that it is the pressure in the lower end of this column which causes piles.

Quénu and later Buie have advanced the argument that the process is originally and endo and periphlebitis caused by local infection. Evidences of infection are commonly found both clinically and in the microscopic examination of the excised varicosity and a close analogy between the process under discussion and the periphlebitis seen in connection with varicose veins of the leg is present. The writer of the opinion however that the infection enters not through the intact epithelium covering the tumors but at the narrowest portion of the anal canal, the area most subject to stool-trauma—the dentate line—and that the points of entry are probably the anal crypts. (See figure.)

CLASSIFICATION ANATOMIC

Hemorrhoids occur in two anatomic locations. External hemorrhoids lie in the distal portion of the anal canal, are covered by squamous epithelium and when hemorrhage does occur it is subcutaneous, resulting in a thrombus. Internal hemorrhoids lie in the upper or proximal portion of the anal canal, are covered by thin velvety columnar epithelium and when hemorrhage occurs the blood immediately oozes through the surface.

*Especially written for the Proctologic number of THE JOURNAL-LANCET.

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The simplest classification of each of these anatomic types of piles is based on following the individual varicosity as it passes through its usual stages, and the many confusing terms formerly present in classifications such as "bleeding," "blind," "venous," "arterial," "capillary," "itching" etc. have been properly abandoned.

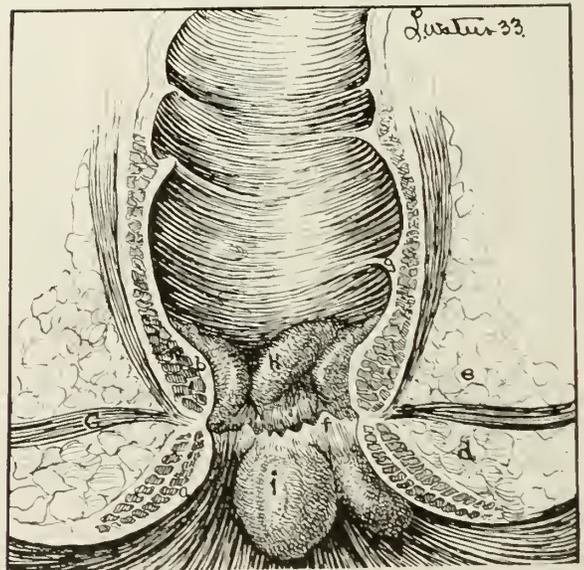
EXTERNAL HEMORRHOIDS CLASSIFICATION BY STAGES

First Stage

The varicose swellings of the circumanal plexus which constitute external piles, while external to the dentate line, lie in their earliest form completely inside the anal orifice. In this first stage a soft bluish collapsible tumor is present which becomes larger on straining or long hours of standing. Dull mild aching may be present without relation to stools.

Second Stage

Due to straining at stool, lifting, or trauma from sitting or twisting the position on hard chairs or automobile seats rupture of one or more of the veins may occur, and as the firm epithelial covering prevents extrusion of the blood a thrombus is formed under the skin. The larger size of the mass forces it out of the anal canal and a firm non-collapsible blue tinged mass is seen on the margin. The discomfort is continuous, not aggravated by defecation, and varies according



to the size of the thrombus and whether a portion of the clot is compressed by the external sphincter muscle. It is quite important that the tumor not be mistaken for an incarcerated internal pile, as replacement is not indicated.

Third Stage

Organization of the thrombus leaves a firm tag of skin on the anal margin. This cutaneous pile is not to be confused with the so-called sentinel pile found at the posterior or anterior commissure of the anus adjacent to an anal ulcer as the latter is the result of marginal edema from nearby infection rather than varicosity.

TREATMENT OF EXTERNAL HEMORRHOIDS

In the first stage, treatment is rarely indicated unless internal piles are present. Rest during part of the day and witch hazel compresses are helpful when aching is a symptom. Anesthetic ointments are of no value in the presence of intact squamous epithelium.

In the second stage the size of the thrombus and the amount of pain present determine whether or not the clot shall be enucleated. If the overlying skin is under little tension, the tumor completely outside the encircling sphincter muscle and the patient in no special pain an ointment containing ichthyol is prescribed and the patient instructed to take a small amount of liquid petrolatum each night to soften the stool. Alternating hot and cold compresses may also be tried.

If the skin is stretched tightly over the clot making it unlikely that organization can occur the thrombus should be expelled to prevent erosion of the skin and infection. If the thrombus is quite large its removal is also indicated to prevent the formation of an annoying tab. The technique of removal of the thrombus includes anesthetizing the surface of the tumor with nupercain, excision of a fair portion of the overlying skin, gentle shelling out of the clot or clots and hemostasis by tying the single bleeding point with plain catgut or touching it with the coagulating current. It is preferable to use a strong enough solution of nupercain to make excessive distension of the tissues unnecessary as considerable post-operative edema will otherwise result. Removal of a bit of skin prevents tab formation. Hemostasis without close wound suture permits serous drainage and discourages infection. The incision should be made as far away from the anal margin as possible, otherwise the wound will be drawn inside the anal canal as swelling subsides and pain will result from sphincter contraction.

INTERNAL HEMORRHOIDS CLASSIFICATION BY STAGES (as suggested by Miles)

First Stage

The varicose swellings of the hemorrhoidal plexus which constitute internal hemorrhoids lie in the upper position of the anal canal, immediately internal to the dentate line (see figure). Their exact location on the perimeter of the anal oval is predestined by the points of termination of the several end-arteries of the superior hemorrhoidal artery, as a plexus is formed at each of these three points. The three chief pile masses will always be found (1) in the center of the left side (2) at the posterior aspect of the right side of the anus and (3) at the anterior aspect of the right side. Because the left terminal artery and the posterior terminal artery give off small branches (the anterior end-artery does not) small varicose buds are usually found adjacent to the left and posterior piles. It is interesting to know that although the plexus is formed at the point where the artery terminates, the varicose mass itself is entirely venous in its composition (Malmgren).

In its earliest stages, an internal pile is a moderate sized plexus impinging on the lumen of the canal, covered by a normal thin columnar epithelium. Pain is not present but bleeding occurs easily as the velvet-like surface is easily traumatized and offers little opposition to flow of blood from the plexus when the latter is bruised. Protrusion of the mass does not occur.

Second Stage

As the plexus increases in size (from constant trauma) the covering epithelium becomes somewhat fibrous and less bleeding is noted by the patient. The increased size of the tumor permits its expulsion during defecation, but the tissues are elastic and the pile spontaneously retracts to its proper position following the bowel movement.

Third Stage

The pile is now a large mass composed of widely dilated veins and covered with a rather tough fibrous epithelium. The sphincter, which has waged a long losing battle in its attempt to keep the anal contents in place, has lost its tonus, and protrusion occurs as a result of any unusual strain as well as at defecation. Elasticity is absent and the mass must be replaced manually. Bleeding no longer occurs because of the fibrosis present in the pendulous investing mucosa.

COMPLICATIONS

While few individuals with hemorrhoids escape unpleasant complicating sequelae, most of these occur when the piles have entered the third

stage. Until they occur, bleeding and protrusion are the only symptoms present; with them come pain, swelling, discharge of pus or mucous and a host of symptoms making diagnosis more difficult.

Fissure may occur either independently or as a sequellae of protruding piles and introduces post-defecation pain which often overshadows previous symptoms.

Incarceration results when the piles are not replaced before edema of the piles and of the anal margin makes it impossible to do so.

Strangulation is an end-result of incarceration, occurring when the blood supply is interfered with by the edema.

Infection is common in ancient piles, manifested by muco-purulent discharge from crypts and mucosa or seen in the form of surface ulceration, accompanied by massive hemorrhage which does not cease following the bowel movement. *Anemia* may reach a profound degree in the presence of such large hemorrhages.

Pruritis occasionally results from mucous discharge in ancient piles. More often it occurs independently.

INTERNAL HEMORRHOIDS—TREATMENT

First Stage—(painless bleeding)

Palliative Treatment

Early piles which bleed very little may be somewhat reduced in size and hemorrhage discouraged by instructing the patient to inject an ounce of full strength witch hazel in the rectum twice daily, using a soft rubber syringe rather than the sharp pointed "rectal syringe" which is often mistakenly advised. Incidentally, hard rubber points and large sharp-tipped "colon tubes" have no place in the treatment of anal or rectal disease because the lack of sensory nerves in the upper canal and lower rectum makes it impossible for the patient or attendant to have warning of injury to the delicate lining.

If thought advisable, the surface of each pile may be touch with five per cent silver nitrate solution to reduce hemorrhage. The anoscope should be used and the piles themselves treated. Smearing the whole anal canal blindly with the solution is undesirable.

The patient should be instructed to avoid coarser food and if constipated should take a small amount of petroleum oil daily.

Suppositories have no special value in the treatment of non-prolapsing piles. They are sometimes helpful in the presence of the protrusion of later stages to assist the patient in returning the tumors completely.

Injection Treatment

Where no complication is present, injections may properly be given for the relief of first stage hemorrhoids. The strong solutions of phenol formerly in use produced slough and their use has been in large measure discontinued. Solution of ten per cent phenol in carriers of water, glycerin, or witch hazel are occasionally used successfully although the dosage must be limited to a few minims if slough is to be avoided. In recent years weak (five per cent) solutions of phenol in oil carriers (mineral oil, vegetable oils or mixtures of each) have obtained considerable popularity. Our own observations supported by careful research* have convinced us that submucosal tumefaction and at times stricture of the rectum are inherent dangers connected with the use of several oils, and it is suggested that mineral oil be avoided completely and that the dosage of other oils (except olive oil which is apparently innocuous) be definitely limited in amount. A recent tendency to attempt the use of irritative agents previously useful in the treatment of varicose veins of the extremities, such as soaps or glucose, is based on a misconception. In the treatment of varicose veins, the irritant is injected intravenously with the desire to produce a thrombus. In the injection of hemorrhoidal varicosities, intravenous injection is not only undesirable but impossible, the injectoin being perivenous and the object being to produce fibrosis and obliteration of the venous network by external contraction. Similar solutions will therefore be unlikely to be desirable.

Since its introduction by Terrill in 1916, five per cent quinine and urea hydro-chloride has consistently gained favor with proctologists in this country, and in my own hands has proven a safe and often effective remedy in the type of piles under discussion.

The patient is placed in the knee chest or inverted (Hanes) position, and a short tubular anoscope inserted. An anoscope with a short bevel on one side is preferable as it is desirable to see the remainder of the lumen for proper orientation. The surface of the pile is painted with five per cent mercurochrome or with any other mild antiseptic.

Good light and good exposure are essential, otherwise the solution may be placed distal to the dentate line which causes pain and often slough. A three cubic centimeter "vaccine syringe" armed with a long needle is used. The type of needle

*The observations of Dr. Stuart A. Wallace, Pathologist to Baylor Hospital, and the writer on this question were reported in the December 24, 1932, number of the Journal of the American Medical Association.

used in tonsillar infiltration will be found convenient. The needle is inserted interstitially in the hemorrhoid to a depth of approximately one centimeter and from one to two cubic centimeters are slowly injected according to the size of the mass. Sufficient solution should be used to distend but not blanch the tumor. Unless immediate control of hemorrhage is urgent it is best to inject only one pile at each treatment. Usually three injections are required for each hemorrhoid, but the period of observation should extend over several months if the best results are to be obtained. A week should elapse between injections of any individual pile.

Occasionally a heavy "bearing down" feeling appears an hour after the injection, which is relieved by warmth of a mild anodyne.

There is no reason for guarantees in connection with using this method of treatment. A patient who insists on complete assurance of future immunity had best be advised to have the piles excised surgically.

Second Stage (decreased bleeding, beginning protrusion)

In this phase of development of the syndrome, there is less assurance of immunity as a result of treatment by injection, and the best plan is to let the patient himself decide whether the piles shall be treated non-surgically or removed completely, after frank discussion of the comparative merits of each plan.

Palliation may be produced as in the first stage by the injection of liquor haemmelis night and morning, small amounts of mineral oil once daily, and a suppository as a mechanical aid if the piles do not immediately replace themselves.

Third Stage (disappearance of bleeding, marked protrusion)

Palliative treatment during this stage is of little avail except in the presence of complications. The patient should be instructed to replace the hemorrhoids immediately after every stool or other strain and to take just sufficient intestinal lubricant once daily to ensure a single soft stool.

Most orthodox proctologists of this country and England are in agreement in discouraging the use of injections in this stage of piles because of the extremely low percentage which are permanently relieved and the frequent presence of complications contraindicating their use.

Honesty to the patient should compel the physician to warn him of the danger of such complications and advise him to have the hemorrhoids removed surgically—preferably under block anesthesia and by simple excision and suture rather than by the obsolete clamp and cautery operation.

TREATMENT OF COMPLICATIONS

Fissure complicating internal piles in the third stage is best handled surgically in connection with the removal of the hemorrhoids.

Incarceration can best be reduced after the patient has been off his feet for some hours and after alternating hot and cold packs have been applied. The use of continuous cold application in the presence of incarceration or strangulation has a tendency to further limit the blood supply. Only the internal piles should be returned to the anal canal, the circumanal edema and thrombosis which often accompanies incarceration and strangulation may be recognized by its skin covering and should be permitted to remain outside the anus.

Strangulation of internal hemorrhoids is a definite indication for surgical removal of the tumors. Fortunately the base of the piles is practically always healthy and removal may therefore be safely carried out.

Infection of the anal crypts and pile surfaces had best be treated conservatively if free pus is present. Small antiseptic douches (one ounce) using mild antiseptics, may be given with an all-rubber syringe of the "ulcer" type several times daily. Through the anoscope the anal crypts and pile surfaces may be touched several times a week with ten per cent silver nitrate solution. If the infection is early, acute and painful, hot normal saline irrigations of the entire rectum may be given for comfort and to increase the local circulation. When the discharge lessens or is seen to be mucoid rather than purulent, the hemorrhoids should be removed.

Hemorrhage when it occurs in later hemorrhoids is often massive, and will be seen to issue from a definite ulceration or abrasion. Removal of the hemorrhoids is indicated. When however the patient already has a marked anemia, or when the patients age or other valid considerations are a bar to proper treatment, it will be found that injections of one cubic centimeter of five per cent quinine urea hydrochloride in the body of the pile will often control the hemorrhage for some days or weeks. This procedure should be carried out with considerable care as the ulceration is often the result of a local infection which may contraindicate the introduction of the needle.

MANAGEMENT OF HEMORRHOIDS OCCURRING IN PREGNANCY

Perhaps the most classical description of this common complication of the parturient state is found in the writing of Francis Ramsbotham, obstetrician to the London Hospital in the first

half of the nineteenth century. "Hemorrhoids, or piles," he states, "dependent on a varicose condition of the hemorrhoidal veins, are often very troublesome under the puerpal state, and some females are subject to them after labour, who experience no inconvenience at any other time." His observations were that they often appeared one or two days subsequent to the birth of the child, were highly irritable and painful and often acquired the size of a large grape or even a pigeon's egg, protrusion from the sphincter occurred, followed in some cases by gradual reduction in size and with-drawal within the anus, from which they reappeared at the next labour; in others, continuing to reappear after bowel movements, to the great annoyance of the patient. Ramsbotham's recommendations for therapy included the application of leeches to the piles, hot fomentations, and an ointment of hog's lard and opium.

The frequency of occurrence of the condition is variously estimated. De Lee stating that varices of the legs or of the vulva or the hemorrhoidal plexus are found in the majority of pregnant women, and that they are marked in twenty per cent. Jellett and Madill, of Dublin, believe that hemorrhoids and varicose veins are of constant occurrence during pregnancy, as a rule being slight in degree, and passing off; but in some cases being severe, and persisting after the puerperium. Practically all observers have agreed the pregnancy serves either to initiate or to aggravate hemorrhoids.

Allingham, a distinguished proctologist of the last half of the nineteenth century, made the following observations of his experience; "During pregnancy external venous hemorrhoids are frequent and these may, and often do, pass away after labour, in common with varicosities of the legs, labia, and vagina, but the reverse is the case with regard to internal hemorrhoids; these most frequently make their appearance after parturition, when all the parts are relaxed and uterine involution is going on." A possible comment of the foregoing would be that while protrusion may first occur after labour, the internal hemorrhoids themselves probably antedate it.

The explanation of the phenomenon under discussion lies in the combination of factors, the pelvic congestion of pregnancy, together with the mechanical interference with the return circulation caused by the bulk of a gravid uterus predisposing to the varicosity or increasing varices already present. Pressure, as it passes over the left aspect of the sacrum anterior to the left common iliac, on the inferior mesenteric vein

which receives the return flow from the higher part of the hemorrhoidal plexus (by way of the superior hemorrhoidal) would predispose to internal hemorrhoids, as obstruction of the hypogastric vein, receiving the blood from the lowest part of the plexus (by way of the inferior hemorrhoidal and pudendal) might be expected to produce external piles. To these factors must be added the trauma of labour itself, with dilation of the sphincter muscle and levators, and temporary but tremendous increase in the local congestion, agencies that also explain the complications that are often seen in the puerperium, fissure, hemorrhage, protrusion, granulations, thrombosis and more rarely gangrene.

The suggested presence of a "pregnancy ferment" causing general varicosity, seems discredited by the fact that none occurs in the upper part of the body. Ada Stubel (in *Medizinische Klinik*, 17, 1325) suggests that there is a general loss of venous tone from nervous or endocrine influences, although the same argument would seem applicable in this case.

The palliative measures that might be expected to alleviate the condition, as well as its prophylaxis, are simple. Prevention of constipation by means of diet and exercise is of course mandatory. But just as important is the substitution of such agencies as agar and liquid petrolatum for salines and cascara when constipation is present, as a soft stool is essential, and the straining from multiple actions following harsh cathartics will often precipitate protrusion or induce hemorrhage.

When protrusion is present, prompt reduction, with the knee-chest position frequently assumed, and the routine use of the bidet or warm sitz bath, is helpful, during both pregnancy and the puerperium. When hemorrhage is the chief symptom several careful injections of quinine urea hydrochloride may be given to control it.

The question of surgical correction of the situation was perhaps more in doubt when the removal of hemorrhoids was a more dangerous procedure. The use of general anesthesia and the clamp and cautery upon a pregnant woman was rightly a questionable step even in the presence of serious symptoms.

The modern technique for hemorrhoidectomy, embracing local or block anesthesia, absence of traumatic divulsion of the sphincters to cause bladder disturbance, and the excision and ligation of the piles, permits bowel function in 48 hours when necessary and can be performed without fear of interruption of pregnancy.

Situations which suggest or require surgical intervention are:

1. The presence at the outset of gestation of hemorrhoids, certain to prove annoying when aggravated by continuation of pregnancy.

2. Complications, such as excessive bleeding not controlled by injection, ulceration or gangrene.

3. Thrombosed external piles, where removal of the clot and redundant skin under local anesthesia will correct an otherwise annoying situation.

THE RECTAL CANCER PROBLEM, WITH SPECIAL REFERENCE TO THE USE OF ROENTGEN AND RADIUM RAYS

(Continued from Page 583)

over 12 months, 65 over 18 months, 35 over 24 months, 20 over 30 months, nine over three years, while one lived four years and eight months.

Of the favorable cases applying for treatment from 1926-1930, 25 were selected for radiation therapy; of these 15 were considered operable and 10 inoperable. An artificial anus was constructed in 12 instances while 13 patients were treated without any form of surgery. Thirteen of the 25 cases are alive and clinically free of disease, and a fourteenth patient is also alive, after five years, and in good condition, but with a questionable status of disease. Of the 11 patients dead, three died of intercurrent conditions and one from unknown causes. Of those dying unmistakably of their disease, one lived for 15 months, one for two years, three for three years and two over four and one-half years. Of those living and well, three have survived seven years, four for six years, three for five years, one for four and one-half years, and the other two for more than three years.

THE TECHNIQUE OF GRADED COMBINED-ABDOMINAL RESECTION OF THE RECTO-SIGMOID AND RECTUM

(Continued from Page 576)

of carbon filament lamp which is employed twice daily. It is astounding how few of these wounds develop severe infections, and how readily most of them heal up. Usually it is a matter of two or three months before they are entirely healed, but I have seen one instance in which the posterior wound had healed, except a small superficial granulating surface, by the end of the 27th day.

The care of the colostomy is an important con-

sideration, and is handicapped rather than advantaged by the use of any complicated or cumbersome bag or attachment to receive the fecal material from the stoma. Since abandoning all such apparatus and relying upon a simple elastic belt, which is much like an ordinary abdominal supporter, and in which is placed a removable rubber mat about eight inches square, I have found that these cases are much more comfortable. They cleanse and irrigate the bowel once a day, place a small amount of cotton or tissue paper over the stoma, and over this apply the simple belt. So long as the stools are formed, there is scant likelihood of unpleasant accidents, except for the escape of gases. When the bowels are loose, any colostomy is intolerable and no type of apparatus is satisfactory. The mental attitude of the patient toward the care of his colostomy, and attention to his diet, are important factors in his comfort.

OPERABILITY AND MORTALITY

Mortality figures for any type of extirpation of the rectum and recto-sigmoid, have been greatly reduced in recent years. Rarely, in experienced hands, will the mortality from any type of operation be higher than 10 per cent in a given group of cases. It may be reduced to three or four per cent by careful selection of cases, and with the use of a graded operation such as colostomy, and posterior resection.

During the past three and one-half years, operability figures in my service for both the single-stage and graded combined abdomino-perineal resections of the recto-sigmoid and rectum, as well as for colostomy and posterior resection, have ranged from 50 to 68 per cent. I have applied the combined abdomino-perineal resection in two stages to 46 per cent of the cases. During this time I have performed this operation in a series of 84 consecutive cases with eight operative deaths: a mortality of 9.5 per cent.

Believing as I do that the combined abdomino-perineal resection of the rectum in one stage is a most desirable operation, since it can be carried out with a reasonable mortality, I feel that its performance in two stages will not only extend the scope of operability, but should result in equally as satisfactory end-results. It is unnecessary to add that this radical type of procedure, whether in one or two stages, is not applicable to all cases. This consequently leaves a field for less radical maneuvers which may be accomplished with low mortality, and at the same time, a relatively satisfactory percentage of five-year cures.

Common Causes of Failure to Cure Rectal Fistula*

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IN A LARGE percentage of the cases of rectal fistula coming into the hands of the rectal specialists from one to several previous operations have been done without cure. It is the purpose of this paper to point out some of the more frequent causes of failure.

There are three primary factors upon which the operative cure of rectal fistula depends, viz.:

1. The internal opening, if any, must be found.
2. All fistulous tracts must be followed to their termini and either incised or excised.
3. The after treatment must be properly carried out.

If any one of these three factors is neglected failure usually follows.

The internal opening can be found in the majority of cases by careful search through the anoscope with a bent probe. In many of the cases where it can not be found in this way the location of the internal opening will be demonstrated by the injection of a staining fluid. Sometimes when the internal opening has not been found by one of these methods it may be found at operation by following the tract from the external opening. However, if the internal opening can not be found the surgeon should never take a chance and make an internal opening. I have sometimes thought that internal openings are about as frequently made as found, by some operators.

In order that all tracts, both the main tract and the branching side-tracts, shall be followed to their termini, it is, in my opinion, absolutely essential that some fluid be injected. Some proctologists prefer a thin bismuth paste which has been heated. If stereoscopic X-ray films are to be taken, and this is frequently a help in very complex cases, the bismuth paste or lipiodol injection serves well. I do not often resort to the X-ray in these cases and prefer to inject the tracts with a saturated solution of methylene blue. Many are opposed to the injection of methylene blue or any other staining fluid upon the ground that the fluid does not reach some of the branches of the fistula and upon the further ground that an excess of fluid is retained in the tract and when opened the entire field is smeared with blue. These two objections are not valid if proper technique of injection is used. The usual method of injection is to insert a small canula

into the external opening and wrap a small piece of gauze tightly around the canula. This gauze is pressed against the skin to prevent back flow of the fluid. But this very pressure frequently closes the tract so that the fluid does not freely flow into the fistula. It has been my practice for a number of years to catch the skin on each side of the external opening with Allis forceps and have my assistant pull on these forceps parallel to the canula, thus giving sufficient counter pressure to balance the pressure of the gauze against the skin. Thus the end of the canula lies free in the fistulous tract and allows the staining fluid to flow freely into the tract. All other external openings should be closed with Kocher hemostats and a large plug of gauze should be placed in the anus over the internal opening and held tightly against the opening while the injection is being done. Thus sufficient pressure on the fluid is exerted to cause it to follow all tracts to their termini. Also it goes without saying that too much force should not be exerted in injecting the fluid because if the wall of the tract is ruptured the fluid will infiltrate through the tissues outside the tract and thereby be a hindrance rather than a help. The tract having been injected in this way, the next step is to press out all excess staining fluid and this may be done by placing a finger in the rectum and making pressure on the skin with the thumb. In this way practically all the excess fluid can be expressed and when the tracts are opened there is no excess of fluid left to stain the field. If this procedure is carried out by those who object to the use of a staining fluid I believe they will withdraw their objections and like it. In excising a fistula I have often cut across a side tract revealing a spot of blue as small as the lead of a lead pencil and many times a probe passed into such a side tract will pass for two or three inches. I maintain it would be absolutely impossible to discover such a small tract unless stained and this is a frequent cause of failure to cure fistula.

Overlooking a sub-mucus fistulous tract is another frequent cause of failure. These sub-mucus tracts are commonly not injected with the staining fluid because they usually extend upward under the mucosa from the internal opening and the staining fluid does not go beyond the internal opening as a rule. However, any sub-mucus tract that has existed for any length

*Especially written for the Proctologic number of THE JOURNAL-LANCET.

†From the Department of Surgery, University of California.

of time causes sufficient induration so that it will not be overlooked if careful digital examination is done. It is wise at operation to search carefully with a probe for tracts running upward under the mucosa from the internal opening. If found they may be injected with the staining fluid before being opened. Sometimes there are two or three branches to such a tract and success depends upon opening all of them.

In my fistula work I always make the dissection with the electro-cautery. It has two prime advantages over the knife and scissors, viz.; the field is not obscured by blood and if the fistula happens to be tuberculous careful excision with the cautery will cure it. I prefer the Post cautery for this purpose. My assistant catches the edges of the incision with Allis forceps and makes traction so that the cautery cuts through the skin and other tissues easily.

I prefer to excise fistulous tracts rather than to incise them. By this procedure side-tracts are easily discovered as one cuts through.

All tracts should be opened wide and those running some distance upward outside the muscularis of the rectum necessitate a wide opening on the skin. When there is a high opening going through the muscular wall of the rectum the tract should be cauterized well up to the muscularis and these high openings almost always close. The edges of the skin should be trimmed off wide for otherwise the skin tends to heal over before the wound fills in from the bottom and this tends to produce bridging and also frequently causes a deep groove in healing and such a deep groove is likely to allow moisture and thin feces to slip down through the anal canal. When a fistula wound closes it should be flat and not a deep furrow.

The cautery is especially valuable in opening up sub-mucus fistulae because hemorrhage is thereby avoided. The old method of passing a ligature up through a sub-mucus fistula, carrying it through the mucosa, tying snugly and allowing it to slough through is poor surgery and ought not to be done.

Careful and efficient search for fistulous tracts within the rectum can only be made with good exposure, and unless one secures a good view of the field, tracts will be overlooked and recurrence will follow. I have found a special bi-valve speculum gives me the best exposure I have been able to secure with any instrument. It was made for me by Sharp and Smith of Chicago upon my specifications. By introducing this instrument and drawing down the margin of the anus with a Pennington forceps an excellent view of about one-third of the cir-

cumference of the rectum is secured. It is especially useful in exposing sub-mucus tracts so that they may be opened up in full view of the operator.

Any attempt to secure healing by first intention by excising a fistula and suturing it is, I believe, almost invariably doomed to failure. I know that many surgeons believe they succeed in curing fistula by this method and thus avoid the tedious process of healing by granulation but it is my belief that practically all of these fistulae recur and the reason the surgeon does not know that he has failed to cure the condition is because the patient nearly always goes to some other surgeon, leaving the previous operator in blissful ignorance of his failure. In my experience I have met with many such cases. I am firmly of the opinion that any attempt to secure primary healing of a fistula by excision and suture is not justifiable.

After completing the operation all tracts should be packed with gauze, which is left in place for four days. It is important that this packing should be placed carefully and the surgeon should be especially sure that he packs the gauze clear up to the internal opening where the tract runs through the anal canal. It is at this point that bridging most frequently occurs if special care is not taken. The gauze is removed on the fourth day and by that time it has loosened from the surface of the wound so that it can be removed with no pain. No further packing should be placed in the wound. The bridging is prevented by the daily passing of an applicator annointed with petrolatum into the rectum and drawing it out through the bottom of the wound in the anal canal. The wounds external to the rectum are painted out with an applicator dipped in any antiseptic the surgeon prefers and a dressing of fluff gauze and covered by a pad is applied and held in place by a T-binder. The use of adhesive plaster to hold dressings around the rectum is to be condemned because infected hair follicles are quite sure to follow and pustules develop. The ancient practice of repacking fistulous tracts with gauze day after day is to be condemned because it retards healing, causes the formation of more scar tissue and is painful. The careful passing of an applicator to the bottom of the wound and through all of its branches is especially essential for the purpose of preventing bridging and the consequent recurrence of the fistula. Healing of all wounds from the bottom outward must be secured.

If the above suggestions are carefully carried out I believe that most of the common causes of failure to cure fistula will be avoided.

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The Soo Railway Surgical Association
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PROCTOLOGY

Interest in rectal diseases dates back to the remotest antiquity. In fact hemorrhoids are mentioned in the Code of Hammurabi about 2200 B.C. Numerous other references appeared from time to time in the writings by the Greek, Roman and Arabian physicians. John Arderne in 1397 wrote a treatise in Latin on the cure of fistula. There were sporadic advances in the care of rectal disease, but to much less extent than in the care of other disorders. Because of this general indifference, William Salmon, who had a keen interest in diseases of the rectum, founded, in 1835, St. Mark's Hospital for the care of rectal disease. This was the first hospital of its kind in the world, and has had a marked influence upon the methods of treating rectal disease. Curiously enough none of the surgeons connected with this hospital limit their work to diseases of the rectum and large bowel and in so far as the writer has been able to ascertain, no one in Europe limits his work to the field of proctology, though the other specialists are well represented.

In America the first physician to have specialized in proctology, was William Bodenhamer (about 1860) who practiced the latter part of his life in New York. He contributed many articles on rectal disorders but it has not been definitely ascertained whether or not he actually limited his practice to proctology.

The father of American Proctology, may very

justly be considered to have been Joseph M. Matthews, of Louisville Kentucky. During the 1880's he determined to limit his work to proctology. We do not know definitely his reason for this decision, but it is quite probable, that like Salmon, he was tired of seeing the poor results of rectal surgery as it was generally done at that time and listening to the groans of our distressed forefathers. Unfortunately such results and agonized cries have not entirely ceased at the present time. In any event, Matthews went to New York, but to his surprise, there was no place where one could receive any special instruction in rectal disorders. All the more determined by this situation he went to London and St. Mark's Hospital for a long stay. Upon his return to Louisville, he soon interested others in improving their technique in the care of rectal diseases, and a number of other men began to limit their work to this field. In 1892, he published an excellent text of some five-hundred pages and many of the facts portrayed are sounded today.

The advancement of this specialty in an organized way began in 1899 with the formation of the American Proctologic Society. Membership in this organization now numbers some one hundred and twenty-five.

Since Matthews' volume was published, numerous other texts have appeared, each of which has shown some advancement in keeping with its time of publication. To my mind, the second

great impetus of interest in proctology came in 1909, when Louis J. Hirschman of Detroit, published the first edition of his text on rectal diseases. This text accurately and concisely showed the possibilities of local anesthesia in relation to rectal surgery. This was a revolutionary change. Previously, all rectal surgery, except the most simple procedures, had been done under general anesthesia, and entailed a rather prolonged period of hospitalization. This idea was doubtless a carry-over from St. Mark's Hospital, where even at present, a hospitalization period of three to four weeks is considered routine for hemorrhoidectomies. Hirschman definitely showed that this was unnecessary in most cases, and that careful technique robbed rectal operations of many of their terrors..

The third and last event to arouse widespread interest, was the injection treatment of hemorrhoids. This method has, of course, been known for many years, but for a long time it was shrouded in mystery and "secret" formulas, and its use limited almost entirely to irregular and itinerant practitioners. In 1913, Emmet H. Terrell of Richmond, published an article in the *Journal of the American Medical Association*, upon the treatment of hemorrhoids by the injection of quinine urea hydrochloride. A bomb could scarcely have aroused the profession more. This paper had the effect of bringing the issue out into the open and stripping the method of any attribute of mystery. Intelligent investigation as to the value of the method, naturally followed. While there was a great deal of opposition at first, I think injection has been definitely shown to have a place in hemorrhoid therapy. In fact at the present time, feeling has gone to such an opposite extreme, that the general impression is about, that a hypodermic syringe and a bottle of solution is the answer to all hemorrhoids. This, of course, is also absurd.

In any event at the present time, there is a far greater interest being shown in proctology than ever before. This is evidenced by the ever increasing number of men who are limiting their practice to this specialty, and also by the number of physicians who though they have no intention of limiting their work, are seeking the proctologic clinics that they may improve their knowledge of this particular phase of medicine.

Many of the men are impelled to do this from the fact that as medical students they received but little instruction in these quite common ailments. This too, is righting itself, and more

and more Medical Colleges are devoting a greater amount of time and instruction in proctology. Proctology has definitely established itself as an accepted specialty, and within a few years even the average sized towns should, and probably will, have men specially trained in this work.

W. A. F.

TUBERCULIN

Tuberculin has become the most diagnostic agent in animal and human medicine. Its value is now being appreciated and it is destined to be widely used by the medical profession. Since Koch first prepared it, Old Tuberculin has been very satisfactory as a diagnostic agent. However, the fact was discovered that the protein content of tuberculin is responsible for the positive reaction when used as a test for tuberculosis. Doctors Long and Seibert, of the Phipps Institute in Philadelphia (formerly of the University of Chicago), set to work to develop a pure protein tuberculin which from every angle would be satisfactory as a test. This work was largely supported financially by the Medical Research Committee of the National Tuberculosis Association. Although those who were carrying on the research work on pure protein tuberculin were not satisfied that the product they had prepared would be satisfactory without further refinement, the Research Committee decided to place it on the market as an experiment. This product was designated MA 100. Immediately workers began to make comparisons between reactions produced by MA 100 and Old Tuberculin and later reported their results. For example, Mariette and his co-workers came to the conclusion that the difference between the two preparations was very slight but in favor of MA 100, while Stewart found no significant difference. Aronson, of Philadelphia, found that with small amounts of freshly diluted Old Tuberculin and MA 100 the results obtained were in close agreement, but with larger amounts a higher percentage of those tested reacted to Old Tuberculin than to MA 100.

As experiments on MA 100 continued, by such workers as Aronson and Sabin, a very disturbing fact came to light; namely, that MA 100 may sensitize the tissues of both man and animals. One readily appreciates that this is a serious objection to its use. For example, a child is repeatedly tested with MA 100 and found to react negatively. The tissues become sensitized after which they react positively both to MA 100 and Old Tuberculin. From this time on, it is impossible to de-

termine whether the positive reaction is due to sensitization to MA 100 or to a true tuberculous infection recently acquired. Another objection to the use of MA 100 is its cost. For example, enough for approximately fifteen or twenty tests costs \$2.00, whereas, for 50 cents enough Old Tuberculin may be purchased for approximately 10,000 tests. Among the chief advantages claimed for MA 100 to offset this are its high degree of chemical refinement and its keeping quality, which is far superior to weak dilutions of Old Tuberculin. The dilutions of the latter ordinarily used in the intracutaneous test may lose a good deal of their potency after two or three weeks (Old Tuberculin in full strength retains its potency indefinitely) whereas MA 100 retains its potency for many months.

In an editorial (JOURNAL-LANCET, March 1, 1933) one reads: "The use of pure protein tuberculin is on trial. Whether it will eventually be substituted for the tuberculin now in use will be determined entirely by careful observation. Certain questions arise in the minds of many tuberculosis workers which only close observation can answer. For example: Is it possible to produce pure protein tuberculin in quantities and with a guaranteed stability at a reasonable price? There is no question about the stability of Old Tuberculin nor is there any question about its specificity, nor should there be any question about the presence of other substances than protein from tubercle bacilli it contains interfering in any way with the test or causing any harm to the person tested because of the extremely minute amount introduced with each test. With Old Tuberculin it is necessary to standardize each batch because of some variation in potency. This is done physiologically. Pure protein tuberculin is standardized chemically but each succeeding batch must also be standardized physiologically as a control measure, unless it can always be prepared with the same potency no matter from what cultures it may be derived. Another important point is that pure protein tuberculin must be prepared so that it will keep clean and uncontaminated in the higher concentrations as Old Tuberculin does. If observation shows that pure protein tuberculin can be produced at slightly or no greater expense than Old Tuberculin, and can be prepared in uniform strength, in all probability it will replace Old Tuberculin. Until this time arrives, Old Tuberculin is a reliable diagnostic agent and as safe as ever."

Therefore, time has proved that MA 100 is not satisfactory. I would not recommend its use for

the following reasons: 1. It has never gotten beyond the experimental stage. 2. It is no more specific than Old Tuberculin. 3. Its cost is exorbitant when compared with Old Tuberculin. 4. It may sensitize the tissues. This alone should disqualify it even if it could be obtained free. 5. It is already practically obsolete.

However, certain investigators in the original research promoted by the National Tuberculosis Association, including Long and Seibert, never having been entirely satisfied with MA 100 as a final goal, have continued their researches and hope soon to present a tuberculin which does not sensitize and which will be satisfactory to those working in animal and human testing alike, and have the support of all concerned in investigating the problem. We will be justified in discarding Old Tuberculin only when these investigators have publicly announced their new tuberculin. From personal conversations with those concerned in this study, it appears that a product combining all the advantages of both Old Tuberculin and MA 100 in the way of high potency, specificity, purity and stability, will be put out shortly. In the meantime we should continue to use Old Tuberculin which "is a reliable diagnostic agent and as safe as ever."

Old Tuberculin contains no tubercle bacilli alive or dead. If a single test is to be administered 0.1 milligram is a safe dose. For this dose one uses a dilution of one part in a thousand and of this dilution 0.1 cc. contains the desired dose. In this dosage I have used the test in many thousand cases and have never seen a serious reaction. However, some workers recommend an initial dose of 0.1 cc. of a dilution of one part in ten thousand, which contains 0.01 milligram tuberculin. With either dose when the test is to be repeated within a week, 0.1 cc. of a dilution of one part in one hundred which contains 1.0 milligram tuberculin is used. A negative reaction to this dose is good evidence that a focus of tuberculosis does not exist in the body.

J. A. M.

CANCER'S EARLY RECOGNITION

That indefatigable apostle of cancer prevention, Dr. Joseph Colt Bloodgood of Baltimore, said much that was worth repeating in his address before the South Dakota state medical society at Huron last May and we would particularly quote the following simple statement. "Remember, the evidence indicates that the medical and dental professions today should be able to make

cancer of the skin, mouth and cervix of mothers a preventable disease; to radiate or remove in time most tumors of the soft parts before metastasis and at a period of growth when they should be cured; to get an X-ray of a sarcoma of bone before metastasis and to cure it by irradiation or operation. The controllable factors are: the duration of the disease, the immediate correct diagnosis, the application at once of the best treatment, and a proper follow-up to check results."

Every physician should have in mind and be prepared to recognize the local condition which may precede cancer or may be the earliest stage of cancer because that is an absolute necessity if he would avail himself of these preventive measures and curative agents that have shown such splendid results when resorted to early.

A. E. H.

SANATOR

In most general hospitals the opportunity for training student nurses in the care of tuberculous patients is either very meager or entirely lacking. The reasons are quite obvious in view of the modern tendency to segregate this type of patient in sanatoria especially designed for such purposes, nevertheless a gap is left in a nurse's training which is distinctly disadvantageous. Not all the tuberculous are in these institutions and when they require nursing in their homes or elsewhere the need for nurses who have the specialized knowledge so essential for the proper care of these patients is apparent. To overcome this defect an important step has recently been taken in the State Sanatorium at Sanator, South Dakota, where, under the guidance of its superintendent, Dr. F. Coslett, an intensive post graduate course has been instituted. On October 5, the members of the first class, consisting of twenty graduates of general hospitals throughout South Dakota, receive their final certificates for this course, "incidentally" we learn "the first post-graduate course offered in any hospital in South Dakota."

We congratulate Dr. Coslett and his efficient organization on the accomplishment of this far-reaching move. Not only will it result in greater efficiency for those doing private and public health nursing among the tuberculous but it will mark another milestone reached in the eradication of the disease by the diffusion of more knowledge regarding its control in the various communities served by those who have had the advantage of this training.

G. C.

SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

Preparations are already under way for the 81st Annual Meeting of the Minnesota State Medical Association following the first meeting of the Committee on Scientific Assembly held at the Lowry Hotel in Saint Paul, September 30. The State Meeting is scheduled for July 16, 17 and 18 in Duluth.

A call for papers on new developments of any sort in medicine has been issued by the committee. Any new moving pictures, demonstrations and exhibits prepared by the members will also be welcomed by the Committee in making up the 1934 Scientific Program.

The general plan for the meeting calls for two mornings of clinical and table demonstrations, Monday and Tuesday, with the afternoons of the same days devoted to papers. Wednesday, according to the present tentative plan, is to be given over to special society programs. The House of Delegates and Council Meetings will probably precede the scientific program on Sunday.

The usual Monday night medical economics program will give place to a scientific program, possibly a cancer symposium, if present plans materialize. There will be a banquet Tuesday evening. All sessions of the meeting will be held at the Duluth Hotel and limitations of space will dictate to some extent the character of the program.

The demonstrations which have proved so popular at the last two state meetings will be emphasized again. Prominent among them in 1934 is to be a heart demonstration. Among other subjects under consideration for demonstrations or papers are neurogenic tumors, treatment of cyanide poisoning, agranulocytosis from barbiturates, newer concepts of lead poisoning and toxicology in general, pernicious anemia and treatment of all the anemias that do not respond to liver therapy, malnutrition among children, diabetes, cancer, adrenal surgery, varicose veins, hemorrhoids, fractures, minor surgery, and skin diseases.

Several distinguished out-of-state speakers will be invited to present papers or clinical and table demonstrations.

The 1934 Committee is composed of Section on Medicine: E. T. Herrmann, Saint Paul, Chairman, R. E. Nutting, Duluth, Secretary; Section on Surgery: W. D. White, Minneapolis, Chairman, J. de J. Pemberton, Rochester, Secretary; Clinical Demonstrations, W. A. O'Brien, Minneapolis.

The Committee will meet again Saturday, November 4, at the Lowry Hotel, the Medical and Surgical Sections' meeting at 5 P. M. to be joined by the others for dinner at 6:30.

YANKTON DISTRICT MEDICAL SOCIETY

The fall meeting of the Yankton District Medical Society was held at the State Hospital, the society being the guest of Dr. and Mrs. G. S. Adams and his staff.

There was the usual fine dinner served in the banquet hall. After the dinner, the meeting was called to order by the President, Dr. J. M. Freshour. The special guests at this meeting were Dr. and Mrs. E. W. Jones of Mitchell, and Dr. MacFall, the new professor of anatomy at Vermillion. After the disposal of the business of the meeting, Dr. Jones was called upon. He brought to the attention of the society some of the problems of the State Association, among them being the following: Lack of cooperation on the part of relief organizations and county boards with physicians and hospitals; marked reduction in membership due to the depression; the ordinary legislator can not be relied upon to fight our medical battles in the legislation. He recommended that at least one physician from each medical society be elected to the legislation; in the federal movement to reduce the number of cattle in the country by slaughter, he asked our support to the plan to confine the slaughter to tubercular cattle only to eliminate tuberculosis from the herds. Dr. Jones also talked at length upon the Federal Emergency Relief Administration for the medical care of the indigent. The scientific program consisted of a neurological clinic presented by the staff of the State Hospital. The program was opened by Dr. G. S. Adams, who made a short talk upon the nature of the cases to be presented. Dr. D. E. Wynegar and Moore then presented several cases of post encephalitis, giving history, signs and symptoms and treatment. Dr. F. W. Haas talked upon the subject of general paresis and then demonstrated the disease with several typical cases. Following this, there was a demonstration of a case undergoing treatment by diathermy. Dr. J. F. Hill then talked upon the treatment of general paresis by malaria and diathermy methods. Both methods are still in the experimental stage, although the malaria method has been used the longer and was therefore more confirmed as to its effects, according to Dr. Hill.

J. A. HOHF, Secretary.

MISCELLANEOUS

PUBLIC HEALTH NURSES

Minnesota needs more public health nurses. There are, in the state, 43 counties where there is no public health nurse. In an educational campaign, now in progress, aimed to place at least one public health nurse in every county, the State Organization for Public Health Nursing is appealing to every health organization, medical organization and civic group in the state for support. The objective of this campaign is an adequate health protection for Minnesota.

Statistics serve to emphasize the inadequacy of public health nursing service in the state. Outside of the three large cities, St. Paul, Minneapolis and Duluth, there are only 126 nurses. Within the three largest cities referred

to, there are 277, more than twice as many as in the entire remaining area of the state.

One of the most valuable services which the public health nurse provides is the apprehension of cases needing medical care. The nurse is on the alert constantly to discover potential cases. In seeking out the early symptoms of disease, in constantly urging the benefits of early diagnosis, she is often the means of accomplishing early recovery, where neglect might have proved fatal. It is the public health nurse, on her rounds, who finds the prospective mother in need of pre-natal care and advice and who sees that she is put under medical supervision. It is the public health nurse, under the direction of the local health officer, who takes the culture which determines whether a sore throat is diphtheria, thereby preventing the exposure of an entire community to a deadly disease.

Securing medical attention where family funds are inadequate is the largest single problem confronting public health nurses throughout the state, according to monthly reports received at the Minnesota Department of Health. In one county the nurse's report showed that the following agencies co-operated in securing eye refraction for ten children: the local doctor, social worker, chairman county relief commission, county board commissioners, county child welfare board, parents, teachers and public health nurse.

"We have been trying for the last four years to get vision defect corrections done in my schools," one public health nurse reported. "Just last week my dream came true. We have 76 who had defective vision. Thirty-six had just a very slight deviation from normal, while 40 had bad marked deviation. I took the matter up with the school board and they were keenly interested in helping the children who needed medical attention. The school loaned us \$200.00 to start off with, the Junior Red Cross gave us enough money to care for three pupils, and the Home Relief Committee took care of three cases also. Our school is going to help pay the difference to the doctor and in the meantime those parents who cannot pay all of their bill at one time are going to be allowed to pay what they can by the month to the school. We just finished fitting glasses on the 40 school children yesterday. So many of the youngsters have been in to my office today telling me how very much better they can see."

In another county the presence of diphtheria in the county-seat stimulated the teachers, school boards and nursing advisory committees to organize preventive programs. Plans for getting the children to the doctor's office or bringing the doctor to the school, as well as remuneration where the parents could not afford to pay for the service, were made by them. The public health nurse assisted the doctor in administering the inoculations.

Because health protection is an essential in every community, this campaign deserves the support of all public spirited physicians and medical organizations.

NEWS ITEMS

Dr. John H. Rishmiller, Minneapolis, has recently returned from a three months trip in Europe.

Eighteen hospitals have been approved in North Dakota, by the annual survey of the American College of Surgeons.

Dr. C. A. Williams, formerly located at Doland, S. D., has moved to Pipestone, Minn., where he will continue general practice.

Polson, Montana, is to have a new hospital that will be modern in every respect and when completed will cost about \$50,000.

Dr. Arthur F. Bratrud, Minneapolis, was one of the principal speakers at the American College of Surgeons at Chicago last month.

Dr. F. M. Manson, Worthington, Minn., was elected a member of the American College of Surgeons, at the Chicago meeting last month.

Dr. Leland G. Russel, a recent grauate of the Oregon Medical School, has joined partership with his father at Billings, Mont., for general practice.

Two Duluth hospitals, St. Lukes, \$7,000 and St. Mary's, \$5,000 were given these respective amounts by the late August Fitger, former resident of that city.

Mt. Vernon, S. D., is badly in need of a physician to locate in that village as they have been without one for several months, the nearest one being 20 miles away.

Dr. Geo. C. Foster, Fargo, will be absent from his office several months, as he has decided to take a post-graduate course at the University of Pennsylvania Medical School.

The District Medical Society held their October meeting at Sioux Falls, with a program made up by a case report by Dr. Goldie Zimmerman, and a paper, "Prostatic Punch Operations" by Dr. Anton Hyden.

A three days reunion of the resident and ex-resident physicians of the Mayo Clinic and Mayo Foundation, was held at Rochester last month, with a large attendance and a most enjoyable program each day.

The new nurses home at the University of Minnesota which has just been completed at a cost of nearly \$400,000 was dedicated on October

27th, with Dr. Richard O. Beard, delivering the dedicatory address.

Drs. N. O. Pearce, president, and E. A. Meyerding, secretary, of the Minnesota State Medical Association, were guest speakers at the meeting of the Ladies Auxiliary at St. Paul last month.

Dr. Thomas Gratzen, who has been in active practice at St. Paul for over twenty years, was elected a member of the American College of Surgeons, at the annual meeting held at Chicago last month.

Washington County Medical Society held their October meeting at Stillwater Minn. The guest speaker was Col. Kent Nelson, chief medical officer at Fort Snelling, presenting a paper on "Tropical Diseases."

The first fall meeting of the Grand Forks Medical Society, brought out over 50 members, with Dr. F. B. Wright, Minneapolis, being guest speaker, his subject was, "Prostotic Resection and Intravenous Pyelograms."

The South Dakota Health Officers held their annual meeting at Huron last month and elected the following officers: Drs. E. F. Ramsey, Clark, president; J. B. Vaughn, Castlewood, vice-president and W. H. Griffith, secretary.

Dr. W. J. Mayo, Rochester, president of the Inter-state Post-graduate Medical Association, presented a very valuable paper on "The Value of Imponderables in Clinical Medicine" at the annual meeting held at Cleveland last month.

Dr. John M. T. Finney, Baltimore, was elected president of the International Medical Assembly; Dr. Charles H. Mayo, Rochester, vice-president and Dr. Edwin Hines, Jr., Milwaukee, historian at the annual meeting held at Cleveland.

Aberdeen physicians were well represented at the last meeting of the American College of Surgeons held at Chicago, the following being in attendance, Drs. J. D. Alway, J. L. Salene, W. D. Farwell, B. C. Murdy, and E. A. Pittenger.

Members of the Tri-County Medical Society held their October meeting at San Haven, N. D., with a large attendance of active and visiting members, Dr. Chas. MacLachlan, superintendent of the state sanatorium, made the principal address.

The St. Louis County Medical Society held their annual meeting at Duluth and elected Dr. M. McFisher, president; Dr. M. L. Strathern, first vice-president; Dr. R. S. Forbes, second

vice-president, and Dr. M. G. Gillespie, secretary-treasurer.

Dr. Harold L. Stolpestad who has been in active practice at St. Paul for many years died on October 18th from a sudden heart attack, while treating a patient. Dr. Stolpestad was 56 years of age and a graduate of the University of Minnesota School of Medicine.

The annual convention of the North Dakota Nurses Association held at Rugby last month was largely attended and a very interesting program was presented. New officers are Mrs. M. Isakson, president; Miss Mabel Herlegaard, vice-president and Miss Pearl Vage, secretary.

Dr. H. R. Weirick, one of the leading physicians of Hibbing, Minn., was found dead in his rooms by the accidental discharge of his revolver. Dr. Weirick had been in active practice in that city for over 30 years, and was widely known as an enthusiastic sportsman.

The first meeting of the Southwestern Medical Society, was held at Fulda, Minn., on October 10th with two guest speakers present. Dr. A. B. Rivers presenting a paper on "The New Developments in the Treatment of Ulcers" and Dr. H. K. Gray, one on "Evaluation of Surgery in Gastric Carcinoma."

An allotment of \$14,500 to the public health service to complete the Rocky Mountain spotted fever laboratory at Hamilton, Montana, was announced by the federal administrator of public works. The money will be expended in improving the steam heating and other equipment necessary to prevent contagion.

Fifty-eight Minnesota hospitals, 16 of which are located in Minneapolis, received the approval of the American College of Surgeons. The approved hospitals have met requirements that "insure safe and efficient service to the patient." Of 3,554 hospitals surveyed, 2,384, or 67 per cent met association requirements.

The Minnesota Trudeau Medical Society have named Dr. E. S. Mariette, Minneapolis, president; Dr. E. K. Geer, St. Paul, vice-president and Dr. D. R. Hastings, Minneapolis, secretary. About 50 physicians were present at the meeting. The society is a state organization for those who are interested in tuberculosis.

Dr. H. R. Hummer, who for 25 years has been superintendent of the federal asylum for insane Indians at Canton, S. D., has announced he will fight the charges made in his dismissal. Dr.

Hummer, was charged by federal authorities with mistreatment of patients. The doctor has denied the charges and has demanded a hearing.

The time of Dr. J. A. Myers, Minneapolis, was well occupied during October with addresses at the following meetings. Oct. 10, the Academy of Medicine, Muncie, Ind. Oct. 11, Convocation, Ball State Teachers' College, Muncie, Ind. Oct. 11, American Association of School Physicians, Indianapolis. Oct. 12, Milwaukee Pediatric Society, Milwaukee. Oct. 13, Indiana State Nurses Association, Indianapolis. Oct. 19, Indiana High School Athletic Association, Indianapolis. Oct. 19, Indiana Coaches Association, Indianapolis.

Peter Reich, an itinerant fakir, posing as not only a physician, but as a specialist, was recently arrested at Long Lake, S. D., on charges of violating two stringent laws, namely: practicing medicine without a regular physician's license and not possessing the special itinerant license which is required of physicians who travel from place to place. Mr. Reich pleaded guilty to both charges and paid \$100.00 on the first charge. A six months jail sentence on the second charge was temporarily suspended on his promise to leave the state.

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). 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 November will be as follows: November 1st—"Hardening of the Arteries"; November 8th—"Do Germs Cause Disease?"; November 15th—"Sugar Hunger"; November 22nd—"Problems of the Premature Infant"; November 29th—"History of Cancer."

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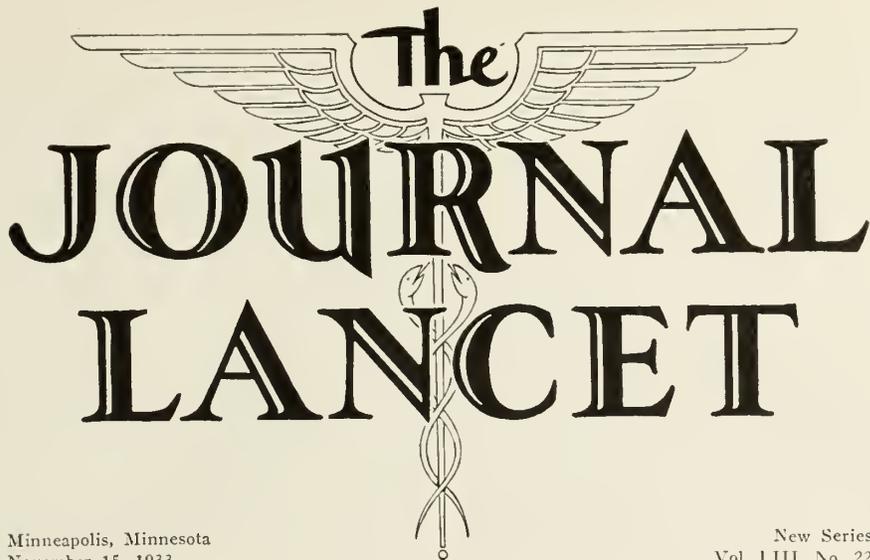
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Silicosis and Associated Respiratory Diseases*

Albert E. Russell, M.D., F.A.C.P.†
Washington, D. C.

DUST is possibly the oldest source of industrial hazard. Knowing as we do how dust is generated, we may assume that as far back as the stone age and farther, people have been affected by it. Certainly the Greeks, Romans, and Egyptians must have encountered this hazard in connection with their extensive construction work with stone. The harmful effects of dust are mentioned in Greek literature, but the Italian writer, Ramazzini, gave us in the eighteenth century the first detailed account of the action of this industrial factor upon the worker.

It is singular that dust as an etiological factor of disease did not receive much attention until during the past 25 years. The rapid industrialization that has come about within this period is probably explanatory of the impulse towards the study of this source of industrial hazard. The most notable example of this fact has been given in the gold mining industry in South Africa, where silicosis, with its complications, became a most commonplace disease among the miners. It became necessary either to study the disease and to devise methods of control of it, or else to abandon mining. Consequently, investigators there have become foremost in this field of research.

*Read before the Hennepin County Medical Society, January 10, 1933.

†Surgeon, U. S. Public Health Service; Chief Surgeon, U. S. Bureau of Mines.

There were about 200,000 people in the South African mines, and the cost of silicosis as a disease alone amounts in compensation to several million pounds yearly. It was because of the excessive incidence of silicosis in the mines around Johannesburg that the International Labour Office of the League of Nations selected that city for the first International Silicosis Conference.

The advances which have been made in all branches of industrial medicine have helped to center attention on dust and its effect upon the health, inasmuch as the number of the workers in dusty trades is larger than that of any other group that is exposed to a single industrial hazard; and an additional reason for increased interest in this subject is gathered from the study of mortality statistics, which have revealed the fact that workers in dusty trades have an excessive death rate from tuberculosis, as well as from other respiratory diseases.

In the consideration of dust as an etiological factor in pulmonary disease, the following points must be taken up:

- (1) the chemistry of dust;
- (2) its concentration and the size of its particles;
- (3) the length of exposure to it;

- (4) the effects produced:
- (a) morbidity.
 - (b) physical condition.
 - (c) pathology.
 - (c) mortality.

CHEMISTRY OF DUSTS

The dusts most frequently met with in the industries are inorganic, and incidentally, such dusts are the most harmful. It has been shown that silica alone produces more permanent pulmonary damage than all other elements found in industrial dust. Originally the dangerous properties of dust were supposed to be dependent on certain physical characteristics, such as hardness of particles and sharpness and angularity of edges. No doubt the physical or mechanical action of dust is a factor in producing chronic pathological conditions in the upper respiratory passages and the bronchi, but the theory that silicosis is produced solely by such action has been generally abandoned.

Doctor Collis¹, in his statement relative to the chemistry of dust, was one of the first to draw attention to the chemical rather than the physical action of dust. He said, "Generally speaking, dusts are more injurious as their chemical composition differs from that of the human body or from the elements of which the body is normally composed, whence it follows that animal dusts are less injurious than others."

Collis², further says: "A study of phthisis mortality rates in dusty occupations has, then, established the fact that when phthisis occurs in excess, it is always found associated with exposure to dust containing crystalline silica."

The Public Health Service has recently completed a series of studies of the effects of the principal varieties of dust encountered in industry. These studies cover the following branches of the dusty industries:

1. The cement industry, representing calcium dust.*
2. Silver polishing, representing metal dust.
3. The granite industry, representing silica dust.*
4. The coal industry, representing carbon dust.
5. The cotton industry, representing vegetable dust.
6. Street sweeping, representing municipal dust.

While the dusts named contained principally the elements indicated they were all

mixed dusts. There are very few dusty trades in which the workers are exposed to a specific dust only, such as that of silica, carbon, calcium, etc., without the presence of other elements in the dust. The cement dust which was analyzed in these studies contained about 60 per cent of lime, the granite dust, about 35 per cent of free (crystalline) silica. The coal dusts, also, were mixed with rock dust, and in many instances, in sufficient quantities to influence the character of the pneumoconiosis. It may be possible that some of the other elements in these dusts exert a synergistic, or inhibitory action; for instance, the lime in cement dust might retard or prevent the development of active tuberculosis. However, more experimentation is needed on this subject. The role of dust as a vector of bacteria has been mentioned frequently, and there is no doubt that it figures prominently in the production of excessive morbidity and mortality from respiratory diseases. The harmful action of dust on the tissues and the reaction incident to its removal lower the local resistance, and this result favors bacterial invasion.

The theory that silica becomes soluble after remaining in the tissues has been generally accepted, and it was also agreed at the International Conference of Silicosis that "there is experimental evidence that the solubility of silica in the tissues is an essential factor in the causation of silicosis." It is generally accepted that the silica particles are removed from the alveoli by the macrophages, which are sometimes called "dust cells," and are stored in the various parts of the lung. Apparently, the gradual dissolution of the silica stimulates an excessive production, with time, of fibrous tissue. Kettle³ contrasts this slow action of silica in the lung tissue with the more rapid reaction which occurs when silica is injected into the subcutaneous tissues, in which case an inflammatory reaction is produced and in a short time necrosis takes place.

The petrography of dust is valuable in deciding its effects; for instance, the chemical analysis of cement dust indicates that there is 15.2 per cent of silica present, while the petrographic analysis shows that it contains only one per cent of free silica or quartz, the known dangerous element. Likewise, chemical analysis of granite shows that approximately 70 per cent of silica is present in it, while by petrographic analysis only 30 per cent of quartz is found.

It has been generally believed that of the industrial dusts free or crystalline silica (quartz) alone is capable of producing excessive pulmonary fibrosis. Recent years have, however, brought new fabrications in the industries, and in some of the new processes it has been shown that certain silicates produce a pathological condition similar to silicosis. One of these is asbestos, a form of magnesium silicate. Likewise talc dust, another magnesium silicate, has been suspected of being capable of producing harm. The end results of asbestosis have not, however, been shown to be the same as those of silicosis. The latter disease almost invariably becomes complicated with tuberculosis, while this is not generally true of asbestosis. We are not sure that all the forms of magnesium silicate produce the same results; there is some evidence that different varieties of asbestos produce asbestosis in varying degrees of severity. It is obvious that more research, both experimental and clinical, is needed on this question.

It would be a very difficult problem to estimate with any degree of accuracy, the number of people in the United States who are engaged in dusty trades,—in fact, under the present arrangements in the different States, such an estimate would be practically impossible. This I learned last year when I was preparing my paper for the International Silicosis Conference. There are more than a half million workers engaged in the coal mining industry in the United States, and it has been stated that there are more than 20,000 workers in New York City alone who are engaged in dusty occupations. It is evident that more people are exposed to dust, which constitutes the greatest single industrial hazard, than is generally supposed. Certain dusts contain poisonous elements, such as lead, arsenic, mercury, etc., which gives rise to general conditions resulting from their absorption. This paper will, however, deal only with those dusts which are known to be direct factors in the production of pulmonary diseases.

The principal industries in which excessive amounts of dust are generated are enumerated as follows. It is not implied that all workers in these industries are exposed to excessive amounts of dust.

Mining.
Quarrying.
Stone (finishing).
Pottery

Abrasive.
Glass.
Pottery (Silica flour).
Mineral earth (Sand).
Spray coating.
Refractories.
Construction.
Smelting.
Grain elevators.
Textiles.

Many occupations in the industries are productive of dust, while the general nature of the industry in which they are carried on may not indicate that any dust hazard is prevalent. These occupations are enumerated thus:

Sand-blasting.
Moulding (cres).
Grinding.
Buffing.
Cleaning.
Polishing.

There are numbers of dusty industries and occupations in the United States which do not necessarily present silica hazards, but have an excess of dust, and in most of these silica is found in a small percentage, and no doubt plays its role in causing an excessive morbidity from respiratory diseases. Some of these dusty industries are the following:

Cement.
Marble finishing.
Graphite.
Coal cleaning.

CONCENTRATION OF DUST

It is necessary to know the concentration of a dust before a definite decision can be made that such a dust is harmless *per se* or that its lack of harmful effect is due to some other element existing in combination with it. A low concentration of a dust containing a high percentage of free silica (quartz) may produce as much harm as a higher concentration with a lower percentage of silica. The fallacy of estimating the extent of dustiness without dust counts is obvious, in consideration of the fact that the particles found in the lungs of workers are less than 10 microns in diameter, and therefore can not be seen with the unaided eye.

Studies of groups of workers exposed to varying concentrations led to the conclusion that 10 million particles per cubic foot of a dust containing about 30 per cent of free silica, as quartz, could be tolerated without

great injury. Workers exposed to this concentration of such dust over long periods developed a mild fibrosis, not of sufficient severity to predispose to tuberculosis. The concentration of dust is a deciding factor in determining dust hazards. If the effects of dust can be shown by X-ray or by physical examination, proof of excessive dust is given; if, however, a worker is exposed to an unknown quantity of a supposedly dangerous variety of dust and does not develop pulmonary changes, it is possible that the concentration is within tolerable limits.

A few years ago an article appeared which pioneered in starting a theory that perhaps silicate of alumina or other elements occurring along with silica may prevent the toxic action of silica. Unfortunately the author, as well as some of his followers, failed to make dust counts and all the other analyses necessary to show that the workers studied were exposed to excessive amounts of crystalline silica. It will be seen in the bulletin on granite dust that certain groups were exposed to the same dangerous dust, but in different intensities, and that the extent of dustiness encountered by the groups with low exposure was not great enough to produce silicosis in as severe form as that developed in some of their fellow workers; and yet the frequency of tuberculosis as a complication in these low dust count groups is not greatly above that of the average population.

Strangely enough, this dust which was reputed to carry certain "anti-silicosis producing" elements along with the silica, contained more silica and smaller amounts of the "anti-silicotic" elements than the known harmful Barre granite dust. This fact is well demonstrated in the following table which compares these dusts:

TABLE NO. 1
ANALYSIS OF "DARK BARRE" GRANITE

Silica	68.89
Alumina	15.08
Iron oxide	1.46
Iron sesquioxide	1.04
Magnesia (MgO)	0.66
Soda	4.73
Lime	2.07
Potash (K ₂ O)	4.29
Water uncombined (H ₂ O at 110°)	0.31
Water combined (H ₂ O ignition)	0.23
Phosphorous pentoxide (P ₂ O ₅)	Trace

Report of Granite Area of Barre, 1902: George I. Finlay, State Geologist of Vermont.

MATERIALS USED IN BRICK-MAKING

Contents of Sample	Brick Factory	
	A	B
Silica	88.90	84.90
Alumina	7.42	9.88
Ferric oxide	0.16	0.19
Manganese, magnesium, and tin oxide.....	0.44	0.85

Soda	1.49	0.84
Lime	0.00	0.34
Water and loss	2.49	3.30

Heffernan, Journal of Industrial Hygiene, November, 1926.

This fact seems to be of importance, since in our own country much credence has been given to the theory mentioned above. An editorial on the subject appeared in the Journal of the American Medical Association; and I understand that this theory is used in almost every court where cases of silicosis come up for consideration for compensation. I do not contend that certain elements may not have "anti-silicotic" properties. I do believe, however, that more scientific work, which will include dust counts, is needed on this question before any positive conclusions can be reached.

LENGTH OF EXPOSURE AND SIZE OF DUST PARTICLES

The study of silicosis which we made in the granite industry will be used as a basis for the following discussion, since it is considered representative of silicosis among a group of workers who are exposed to varying concentrations of a dust containing a known quantity of free silica or quartz.

The extent of exposure of these granite workers is indicated as follows: Group D, 10 million particles per cubic foot or less; Group C, 10 to 20 million; Group A-B, 20 to 60 million.

Figure 1 shows the number of persons without silicosis and the number diagnosed as having either early or more or less advanced silicosis, according to the number of years of exposure and according to the dust group in which their exposure places them.

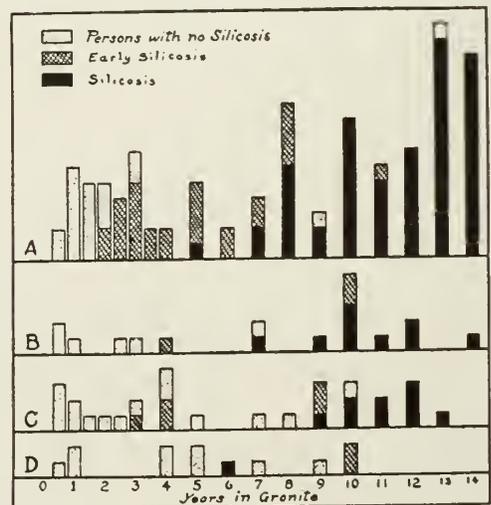


Figure 1

We may say that practically 100 per cent of the granite workers who were exposed to dust particles in the concentration of 40 to 60 million particles developed silicosis by the end of 15 years' service. It is evident that if the silica content of the dust were greater or if the concentration were greater, silicosis would develop earlier. The size of the dust particles in this occupation was generally less than 10 microns in the greatest diameter, the greatest number being less than five microns.

EFFECTS OF EXPOSURE TO DUST

The effects produced by the inhalation of dust are now considered, under the headings of morbidity, physical condition, pathology and mortality. Silicosis and tuberculosis are outstanding here, inasmuch as they cause a greater amount of disability and mortality in the dusty trades than any other diseases or combinations of diseases.

The incidence of sickness (eight days or more) from all causes in the four dust count groups by length of service is shown in Figure 2. It is clearly indicated that the men with the greatest exposure have more illnesses. Even when sickness from tuberculosis is eliminated, the rates were still higher in Groups A and B than in C and D.

Figure 3 shows how the rates shown in the previous graph (Fig. 2) have been increased by tuberculosis. This figure shows also the

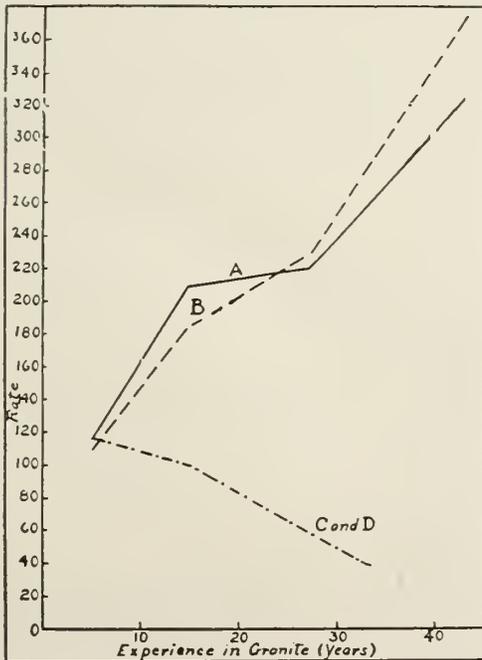


Figure 2

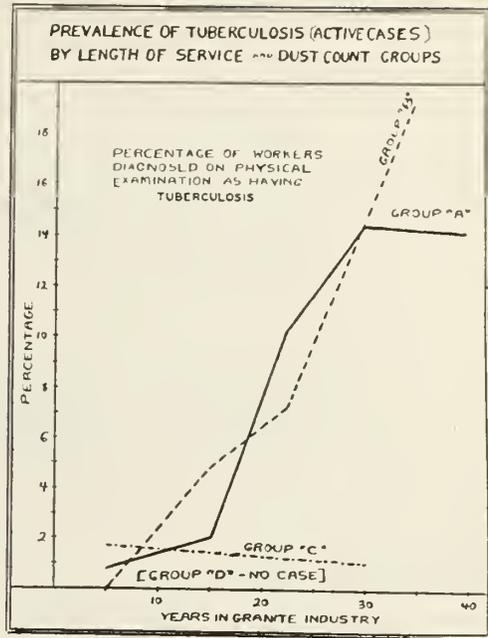


Figure 3

prevalence of tuberculosis (active) by length of service and by dust count groups.

The effects of concentration of dust and of length of service are clearly shown in this graph. The workers (Groups A and B) who had the greatest exposure developed silicosis and tuberculosis in greater frequency with length of service.

The next graphs are presented to show the frequency of disability due to respiratory diseases alone lasting more than a week (accidents excluded) in various industries.

Figure 4 shows the excessive amount of tuberculosis among granite workers, its incidence being greater than that of influenza. The relatively low incidence of tuberculosis among gold miners, who are exposed to a highly siliceous dust, may be due to the shorter length of their service as compared with that of granite workers.

The lower portion of the figure deals with the occurrence of pneumonia. The iron and steel workers, who have had the lowest incidence of diseases shown in these figures, have the highest sickness rate from pneumonia. The anthracite miners were lowest in pneumonia.

The records from which data were taken for the general manufacturing group were provided by plants in the Northern States and east of the Mississippi River. Practically all the groups have similar climates, and it is believed that these rates are comparable and

FREQUENCY OF DISABILITY LASTING LONGER THAN ONE WEEK ON ACCOUNT OF
TUBERCULOSIS AND PNEUMONIA IN INDUSTRIES SPECIFIED

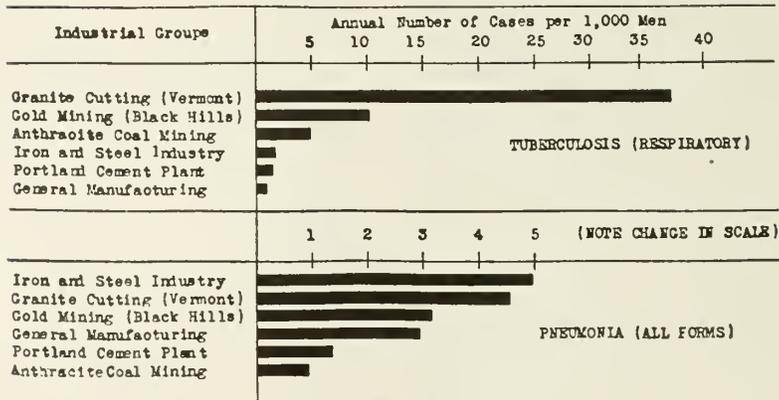


Figure 4

that variations in climates have not materially affected them.

DIAGNOSIS OF SILICOSIS

The history of the patient is very important in the diagnosis of any disease, but is particularly valuable in connection with occupational diseases. The present occupation of the patient may not be informative, and for this reason, among others, it is necessary to become acquainted with the nature of the patient's former pursuits.

It has been my experience that workers in dusty trades are reluctant to admit that their pulmonary disabilities are due to their occupations, unless they are making claim for compensation.

GENERAL APPEARANCE

Patients with silicosis in uncomplicated form are usually well nourished and apparently healthy, except, of course, in the advanced stages of the disease.

Limitation of chest expansion is a very consistent finding, and unless the patient has engaged in athletics, the extent of limitation is usually in proportion to the length of service. The restriction of the chest was found (each side was measured with obstetrical calipers) to be symmetrical, in contradistinction to the assymetry occurring in pulmonary tuberculosis.

Dyspnoea is usually the first symptom and most constant complaint in silicosis, and it increases with length of exposure and even after exposure ceases, if the disease has become well established. Dr. Lanza, the American pioneer in the study of silicosis, observed a

very great amount of dyspnoea among the miners with silicosis in the Joplin District, Missouri. I do not know of any clinician who has failed to mention this finding when describing the symptoms of silicosis.

It has also been my observation that pains in the chest were a common complaint. A cough, which was usually non-productive, and frequent colds were also in evidence.

DIAGNOSIS OF SILICOSIS

Most of the physicians with whom I have worked or have discussed silicosis are prone to rely solely on the X-Ray findings for diagnosis. These men had not been doing tuberculosis work, however, and were not particularly adept in the usual procedures employed in making physical examinations of the chest. The X-ray does give more information than

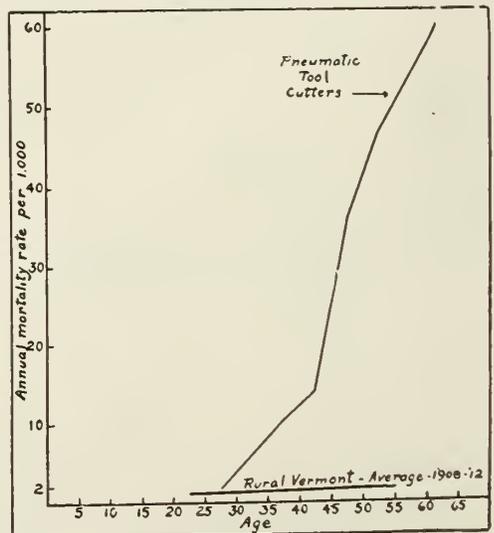


Figure 5

any one other means. However, much can be learned by physical examination, which can usually be confirmed by the X-ray.

The following are some of the principal points in diagnosis by physical examination:

Percussion usually reveals a general impairment of resonance, the intensity of which aspect varies as a rule with length of service. This finding is consistent with the character of a generalized fibrosis, which is a common characteristic of silicosis.

Tactile and vocal fremitus were not changed appreciably in the earlier stages, but as the generalized fibrosis of silicosis increased, these were usually not increased appreciably.

Fibrosis of tuberculosis causes an increase in both tactile and vocal fremitus. The condition is, however, localized, whereas the fibrosis of silicosis is general throughout the lungs.

BREATH SOUNDS

In my cases of granite cutters there was no marked change to any particular variety of breath sounds in uncomplicated cases, but rather a softening (or "soft pedal" effect) on all the breath sounds, which naturally brought out the vesicular type of breathing. I believe this is due to the generalized fibrosis.

Rales were absent in the uncomplicated cases. No toxemia was present, which is accounted for by the absence of infection.

The classification of the stages of silicosis has an interesting history. As I said before, the South African investigators were first to study the disease thoroughly. They found a condition which they called "primary silicosis." Compensation was given for this condition, and the name became a legal term. Further study of the cases and newer manifestations of the disease showed the necessity for new designations of its stages and so the term "ante-primary" was used.

Today the South African cases are classified as follows:

1. Rather more fibrosis than usual.
2. More fibrosis than usual.
3. Ante-primary.
4. Primary.
5. Secondary.

This classification could not be conveniently changed, since legal involvements might be entailed. It was not meant to be suitable for universal application. It is regrettable that here in America investigators have attempted to utilize it in classifying cases of silicosis that

were exposed to less hazardous conditions than those of Africa.

I am presenting here some of the recommendations of the International Silicosis Conference on diagnosis and classification. You will see that these are broad and more suitable for general use than the classification previously mentioned.

"For the diagnosis of silicosis as a disease it is necessary to take into consideration—

- (a) The employment history.
- (b) The symptoms and physical signs.
- (c) The radiological findings.

"The disease can conveniently be divided into three stages, designated 'first,' 'second' and 'third' stages.

"In the diagnosis of every stage of silicosis a history must be established of exposure to inhalation of silica dust in a quantity commensurate with the clinical and radiological findings.

"In the first stage, symptoms referable to the respiratory system may be slight or even absent. Incapacity for work may be slightly impaired. There must be a departure from the normal in percussion and auscultatory signs, and the radiogram must show an increased density of linear shadows and the presence of nodular shadows.

"In the second stage there must be an increase of all the physical signs observable in the first stage, and the radiograph must show an increase in the number and size of the nodular shadows with a tendency to confluence.

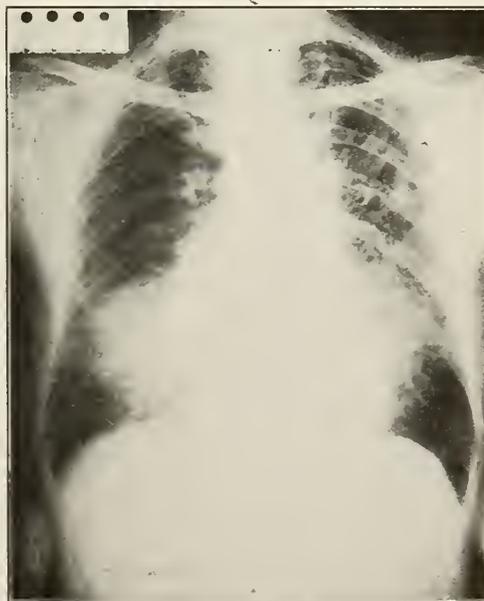


Figure 6



Figure 7

There must be some degree of definite impairment of working capacity.

"In the third stage all the above conditions are grossly accentuated, and there is total loss of working capacity.

"Tuberculosis may be present in any of the above described stages, altering the symptoms, physical signs, and radiographic appearances, and the degree of working incapacity. Its presence must therefore influence the stage classification of the subject, which classification must, in these circumstances, be based more or less on working capacity than on physical signs and radiographic appearances.

"Radiographic appearances may be found to occur apart from those of silicosis—in the form of linear shadows, and if these are interpreted as evidence of fibrosis, they should be classified as slight, moderate and well marked."

TUBERCULOSIS AS A COMPLICATION OF SILICOSIS

It is not surprising that workers in dusty trades who have latent tuberculous infections become disabled earlier than the average individual. It was our experience that these cases developed silicosis more rapidly, and that when they developed the clinical tuberculosis, they were still young people and the disease ran a more prolonged course. This was not true of the cases which developed silicosis first. The South African investigators, too, have observed that the cases which they classify as "phthioid" break down with tuberculosis early in their mining careers.

DIAGNOSIS OF TUBERCULOSIS COMPLICATING SILICOSIS

Physical examination of silicotic patients who are breaking down with a tuberculous complication provides information which is not always available with the X-ray. Dr. Pancoast stated in a talk on pneumoconiosis at the local (Washington) medical society recently that during this traditional stage the differential diagnosis is often impossible. When the tuberculous complication has advanced, diagnosis is, of course, easy.

Inquiry into the patient's condition will usually reveal symptoms which are common to uncomplicated tuberculosis. It was our experience that early complaints were fatigue, night sweats, increase in dyspnoea, pains in the chest, and an afternoon rise in temperature. There was frequently complaint of a cough, which was productive. Many patients had hemoptysis and later in the disease, frank hemorrhages from the lungs. Loss of weight did not seem to occur so early as in uncomplicated cases, but when this symptom became manifest, it was marked. Tubercle bacilli were usually found in the sputum early in the disease.

The later stages presented no great differences from those fulminating types of uncomplicated tuberculosis.

The physical signs presented variations from those in uncomplicated cases, inasmuch



Figure 8

as there existed already a general pulmonary fibrosis. The latent or post-tussive rale was constant and not unlike the same valuable pathognomonic sign in uncomplicated cases of tuberculosis.

The X-rays of cases in this stage usually revealed areas of conglomeration, or fusing, of fibrotic markings. They were less distinct in character than in uncomplicated silicosis. This fact will be demonstrated in the slides. (Fig. 6, 7, 8, 9.)

PATHOLOGY

It seems pertinent to refer again to the etiology of silicosis in connection with its pathology. The work of Dr. L. U. Gardner, of Saranac Lake, N. Y., on the etiology and pathology of silicosis and tuberculosis cannot be too highly commended. He served on the Committee of Reporters on the Medical Aspects, Etiology, Pathology and Diagnosis of Silicosis at the recent International Silicosis Conference. The report of this committee on etiology was as follows:⁴

"Silicosis is a pathological condition of the lungs due to inhalation of silicon dioxide. It can be produced experimentally in animals.

"To produce the pathological condition, silica must reach the lungs:

"(a) In a chemically uncombined condition, although the dust inhaled may be either a natural mixture of silicon dioxide with other dusts, such as occurs in granite, or an artificial mixture, such as scouring powder.

"(b) In fine particles of the order of less than ten microns, there is no evidence as to lowest limit of size in which the particles may be capable of producing the disease.

"(c) In sufficient amount, and over a certain period of time. These two factors are reciprocal variants. The minimum of these two factors has not yet been determined.

"Silica dust plays the dominant role in the production of silicosis, admixture of other dusts tending to modify the picture in the direction of that of other pneumoconiosis, in some relation to the proportion of free silica inhaled.

"There appears to be experimental evidence that the solubility of silica in the tissues is an important factor in the causation of silicosis.

"Infection of the lung with *B. tuberculosis* or other pathogenic organisms, whether it occurs before, simultaneously with, or subsequently to the development of silicosis, alters and unfavorably influences the disease, tuber-

culous infection being particularly unfavorable."

Kettle³ gives explanation as to why tubercle bacilli proliferate in the necrotic center of the silica lesion, naming the following reasons:

"First, the mere mechanical protection of bacilli during their early lodgment in the body; second, the rich pabulum furnished to the disintegrated cells; or third, the stimulating action of silica on the growth of the bacilli." It is also well known that tubercle bacilli grow well in a medium rich in colloidal silica.

Kettle's final opinion as to why silica dust is dangerous, as far as the production of tuberculosis is concerned, seems to be that it is not because of the fibrosis produced by the silica, nor because of the damage which silica does to the lymphatic system, but that it is simply because of the presence of silica in the lung.

Gardner's experimental work with animals inoculated with a stain of tubercle bacilli of a low-virulency and later exposed to dust, is noteworthy.⁵ A series of guinea pigs were primarily infected by the inhalation of tubercle bacilli of low virulence. The animals developed an infection, which finally healed by resolution. By placing groups of these infected animals in dusting chambers and subjecting them to at least two months' exposure to dusts, a reactivation of the primary tubercles was brought about as late as 206 to 400 days after infection. Of these pigs exposed to quartz dust, 73.6 per cent exhibited evidence of a progressive tuberculosis, and likewise 31.8 per cent of those exposed to carborundum dust (SiC) and 26.3 per cent of those exposed to granite dust. The groups of pigs exposed to marble and coal (bituminous) dusts did not undergo a reactivation of the disease. Dr. Gardner states that "the reaction appears to be a specific result of the inhalation of certain definite types of dust, for evidence has been produced to show that factors like overcrowding, lack of proper ventilation and light, endemic pneumonia, and nonspecific inflammations have not influenced this type of tuberculous infection." Apparently the same effect is not obtained with other bacteria in the dusted pulmonary tissues as with tubercle bacilli. The excessive amount of other respiratory diseases can be accounted for, however, by the lowered local resistance caused by the presence of dust, the diminution of the local blood supply by fibrosis, and the excess of bacteria carried into the lungs on the dust particles.

The summary of the pathological changes in silicosis which was made at the International Silicosis Conference is as follows:

"It was agreed that the pathological changes of silicosis are:

"(a) The development of a condition designated in South Africa as a fine bronchiolitis, characterized by an accumulation of dust filled phagocytes in the terminal bronchioles, and possibly some desquamation of their epithelium.

"(b) The accumulation of dust-containing phagocytes about and in the intra-pulmonary lymphoid tissue, especially in the sub-pleural zone, and their transportation through the lymphatics into the tracheobronchial lymph nodes.

"(c) The gradual development of fibrous tissue within the mass of phagocytes and the formation of a characteristic nodule of hyaline fibrous tissue.

"(d) Degenerative changes in these foci.

"(e) The hyaline nodules increase in size by extension at their periphery.

"Coalescence of adjacent nodules takes place and brings about involvement of extensive areas of the lung.

"Macroscopically the changes observed are:

"(a) *In the early stage*—a variable number of palpable pearly-white nodules up to two or three m.m. in diameter on the pleural surface of the lung. On section, the cut surface is studded with pigmented foci, widely scattered, which are only just palpable. The tracheo-bronchial lymph nodes are slightly enlarged and deeply pigmented, any may exhibit strands of fibrous induration.

"(b) *Later stage*—The fibrotic nodules are increased in number, size and density, and coalescence of these may be found. The portion of the lung between the fibrotic nodules is emphysematous. The tracheo-bronchial lymph nodes are still pigmented, smaller in size than those seen in early stage, and uniformly fibrosed.

"The presence of tuberculous infection usually modifies the pathological appearance. Special attention was drawn to the three following types:

"(a) In which the picture of simple silicosis is little if at all modified, and in which only a biological test can demonstrate the presence of *B. tuberculosis*.

"(b) In which the coexistence of silicosis and typical tuberculous lesions is easily recognizable.

"(c) In which the presence of tuberculosis is easily recognizable, but the existence of silicosis is more difficult to determine.

"There is evidence that with *B. tuberculosis*, *in vitro*, the period before growth becomes apparent is shortened in the presence of silica, and that *in vivo* an environment favorable to the continued growth of the bacillus is produced in the presence of silica, but the virulence apparently remains unaltered.

"In massive silicosis cardiac hypertrophy and subsequent dilatation may occur. In silicosis with infective processes, cardiac changes may also occur.

"No evidence was adduced in regard to involvement of kidney and liver."

COURSE OF SILICOSIS AMONG WORKERS NO LONGER EXPOSED TO SILICA DUST

In the study of silicosis one of the most important questions which has arisen is the health history of those individuals who have worked in the granite industry for a number of years and then left, to find occupations in other trades where there was no further dust exposure. It was possible during the course of the study at Barre to observe 24 such cases.

The latency of silicosis has been referred to by other investigators. The South African workers found that "a steady fall over a period of years in dust concentration is not associated with the corresponding fall in the silicosis incidence." Dr. Watkins-Pitchford⁶ also records cases of miners who had been exposed to dust for a long period of time, apparently sufficient to develop silicosis, but who went into the war apparently not silicotic. He asserted that such cases were liable to develop tuberculosis. Doctor Pancoast presents a case of advanced pneumoconiosis in a quartz miner who had been exposed to dust for eight years. He had been out of the mining industry for 10 years, yet the X-ray showed extensive pneumoconiosis with irregularities of diaphragm, and by fluoroscope he found the diaphragm restricted on each side. There was, perhaps, a tuberculous infection intervening at the time.⁷

Britton⁸ reports two cases of workers who had been exposed to dust between seven and eight years. They changed occupations and had been away from siliceous dust for eight and nine years. They developed pulmonary symptoms and were found to be suffering from silicosis and tuberculosis. Tattersall⁹ also observed cases of latent silicosis in his studies: "Some of the men (rock drillers), moreover,



Figure 9

had changed their occupation for various reasons quite apart from health, but in due course the inevitable dyspnoea came on. One man, for instance, worked eight years regularly with rock drills, from 1906 to 1914, then joined the army, was passed as A-1; but in spite of his open-air life, dyspnoea came on in 1918, and from then until his death six years later his illness was a typical case of silicosis."

It was an interesting finding in the study of workers in dusty trades that when patients had been exposed long enough to develop silicosis and then changed to non-dusty occupations, that they did not thus materially lessen their chances of escaping a final tuberculous complication. Attention is invited to Graph 4 on which the granite manufacturers are shown to have almost as much tuberculosis as stone cutters and lumpers, many of these manufacturers were formerly stone cutters and no doubt developed silicosis before establishing themselves in their new occupation.

MORTALITY

The influence of dust on mortality from tuberculosis is clearly indicated in the following table. New methods of manufacturing stone which created excessive dust by the use of pneumatic tools, were introduced in the granite industry about the beginning of the present century, and the tuberculosis rate has increased rapidly with their use. The rate has risen in direct proportion to the length of time

during which they have been employed as follows:

1890-1894	1.5 per 1,000
1910-1914	10.8 per 1,000
1924-1926*	19.5 per 1,000

(*During period of our observation.)

A consideration of the mortality statistics of Barre, Vermont, shows that there has been an excessive death rate from pneumonia and other respiratory diseases (tuberculosis excluded) during this period.

The final graph shows the age curve of mortality between workers using hand pneumatic tools and males in rural Vermont. The rate of the latter may have been influenced by the fact that many disabled cutters move to rural districts. However, the contrast between the two rates is great.

SUMMARY

Morbidity and mortality records indicate that workers exposed to dust have excessive rates of respiratory diseases.

Inorganic dusts produce more pulmonary disability than organic dusts.

Silica (SiO_2) of the crystalline variety (quartz) is the element in dust which produces greatest pulmonary damage, and it is present in varying extents in most industrial dusts.

Silicosis is insidious in its onset and progress and presents but few symptoms or physical signs in its early stages.

Silicosis is almost invariably complicated by tuberculosis after a number of years of exposure, which time depends upon the concentration of the dust and the percentage of free silica which it contains. Latent tuberculosis is usually activated after shorter exposure to siliceous dust and has more characteristics of this disease in persons not in dusty trades.

Before a dusty trade can be absolved of its danger or stamped as dangerous, the concentration of dust and its chemical and petrographic analysis must be shown.

Dust should be removed at its source. General ventilation lessens dust content of air by dilution.

Masks frequently give a false sense of protection, but some form of personal protection is necessary in absence of proper exhausts and good ventilation.

There has been a great reduction in the death rate from tuberculosis among the general population during recent years, while among workers in dusty trades, there has been a great

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The Spirit and the Revenue of the Physician and the Private Hospital*

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Minneapolis

THE word "service" has grown tawdry and meaningless from use in the commercial world. In this connection service implies a commodity for which the purchaser pays. The service upon which the entire profession of medicine and the sphere of the hospital is built is far reaching; it means the utmost of care and consideration of the patient carried to the extent that money could never actually repay. On the basis of the service that intangible but absolutely essential confidence of the patient in the physician and the hospital is grounded. Service and the resulting confidence made up the spirit of the private hospital and the private practice of medicine. Although giving more than they received, the hospital and physician established a situation which yielded an adequate livelihood for both.

A number of years ago the economic condition of our country was so promising that a false sense of security was developed throughout the nation. Physicians and administrators of hospitals were no exception. At medical society meetings and in staff rooms of hospitals, one frequently heard physicians who had been in practice a few years make the statement that they were beginning to select their patients. There were usually two bases upon which they were selecting their clientele: first, those families who had sufficient funds and always paid their bills promptly; second, those persons with diseases easily treated and which caused the physician little annoyance. Patients unable to pay all of the usual fee, as well as those unable to pay anything, were to be sloughed off. They could go to the so-called free dispensaries. Patients who had tuberculosis constituted a group he desired to slough off from his practice because the treatment of tuberculosis to many physicians at that time was a discouraging undertaking; so many of them had hopelessly advanced disease when detected. Many physicians had fear of tuberculosis and did not care to come in contact with those suffering from this disease.

This idea of selection of clientele extended through the private hospitals. They preferred

to keep their beds occupied with the type of patient who could pay the full fee and who caused very little disturbance and very little work. The two main groups they rejected were the nervous and mental and the tuberculous cases. This ease of practice and hospitalization seemed ideal; physicians and hospitals were not annoyed and they were well paid. When the financial crisis began and gradually grew worse, many families who had formerly paid their physicians were no longer able to do so; many who had previously used the private hospitals were likewise unable to pay the usual fee for such care. Physicians saw not only their number of patients diminishing but their revenue definitely decreasing. Some hospitals saw 50 per cent or more of their beds vacant; their books actually showed deficits. Both the physician and the hospitals began to cast about for patients who could pay lower fees and for those with diseases less pleasant to treat; in other words, those they had previously sloughed off. As they did so, they saw that huge buildings and even groups of buildings had been erected in many parts of the country, where the classes of patients, private physicians and private hospitals had originally cared for, but who had been dropped from the practice of such physicians and hospitals, were being diagnosed and treated at the expense of the taxpayer. They saw that with the exclusion of these patients had gone the oldtime spirit of the private hospital. It was no longer an institution whose chief aim was to serve humanity.

Is it possible for the private hospital ever to regain its oldtime spirit? In attempting to answer that question several discouragements loom. The hospital has not only driven from its door certain classes of patients, but through its school of nursing its students have been taught that such patients should never enter the doors of the private institution. In addition, it finds that the alumni of the school of nursing, widely scattered, are serving a valuable function as health educators, in addition to their regular work. It finds that these health educators, along with the physicians, themselves, are teaching the public that certain disease conditions should be diagnosed and treated through funds derived

*Presented before the Medical Staff of the Asbury Hospital, Minneapolis, January 4, 1933, and the Medical Staff of the St. Mary's Hospital, Minneapolis, February 14, 1933.

by taxation regardless of the financial status of the patient and his family. The diseases thus cared for were those which the private physician and hospital had ignored. The hospital finds some of these tax-supported institutions built into great monuments at the expense of the taxpayer. When this had been done, by way of numerous and huge buildings, oftentimes with capacities far beyond the needs of a given community, these tax-supported hospitals began reaching out their arms into the communities beyond the confines of their walls. Such institutions did not cling to the original purpose for which they came into being; for example, the United States Veterans Bureau Hospitals, originally intended for ex-service men and women disabled by injury or disease in line of duty, have gradually increased the scope of their work until recently, fourteen years after the war was over, they were asking for an increase in capacity approximately double that of the present time. They are no longer satisfied to care for just the ex-service men and women; they now, with outstretched arms, are asking for money to care for all service men and women who have fallen ill or have in any way become disabled since the war. Even this is not enough; they want the families of all ex-service men and women. Their vision extends even beyond this, since some have suggested that the institutions originally built for veterans be so enlarged that they can serve as community hospitals.

Inasmuch as our tax-supported institutions for the tuberculous were originally intended for the poor, I have never been able to find myself in sympathy with the policy which allows payment of fees by the patients. Our method of determining who can and who cannot pay should be so perfected that only the deserving can be admitted. In other words, they should be truly tax-supported institutions. This would relieve the superintendents of financial worry. The National Jewish Hospital for Consumptives in Denver is supported not by public taxation but by private subscription. It was built and is maintained for the poor, regardless of religion or race. Those who subscribe to the support of this institution demand that their money be spent wisely, in fact, one finds on every sheet of stationery from that institution the following: "None May Enter Who Can Pay—None Can Pay Who Enter."

All physicians, hospital authorities, and most all other American citizens, are of the opinion that we can never do enough by way of providing facilities to treat and make comfortable the

service men and women who were injured or contracted disease in line of duty, and for indigent tuberculous patients. They are most deserving and excellent care must always be provided for them. The fact is attested in the frequent and liberal appropriations of funds for the building of hospitals and sanatoriums for them and in the subsequent maintenance of such institutions, but advantage was sometimes taken of the taxpayer by those who sought to diagnose and treat persons who are not legitimately eligible, to the point of actually over-building the capacities of their institutions.

Until approximately this time, many taxpayers have not suffered from the burden of taxation. They have thought little of how lavishly, inconsistently, and illogically a part of their tax dollar has been spent. They are now beginning to awaken and if the depression continues, it seems probable that they will demand that their tax money be expended only for those who are deserving and for whom they originally provided institutions and other necessary facilities. The medical profession of Minnesota is greatly pleased with the policy of the University School of Medicine and Hospital which provides for just enough patients in the hospital as well as the out-patient department to teach students adequately.

Preventive medicine has practically eradicated certain diseases, such as typhoid fever and diphtheria, which at one time caused much illness, and the diseases themselves, together with their sequelae, resulted in great demand for hospital beds. Those diseases are gone forever, unless a catastrophe overtakes us which makes it impossible for our preventive measures to be continued. Since a great block of patients suffering from such diseases has been removed from the present and future possibilities, the private hospital must turn back and reconsider admission of patients suffering from disease conditions which were formerly sloughed off. We now have plenty of beds for them. The present generation of physicians and nurses needs to be better informed concerning these diseases and they are not an insignificant source of financial revenue for the hospital and the private physician. I refer to communicable disease, particularly tuberculosis.

There are many cases of tuberculosis which should be admitted to private hospitals, not only because of their financial status but also because experience has shown that they can be treated just as successfully there as in tax-supported institutions.

There has developed a spirit on the part of the public which has taken away the pride of many people. Some who would not think of going to relief agencies and asking for a meal ticket; people who would not accept a ton of coal or a basket of groceries; people who would not wear old clothes provided by the Salvation Army, apparently have no conscience when it comes to sending the members of their families to institutions intended for the tuberculous poor. Any conscience that some of them may have is soothed by the fact that they are taxpayers and if they desire they may pay one, two or three dollars per day to such institutions. Even if they pay three dollars per day, the taxpayer is still carrying a good deal of their burden.

There exists in the United States, according to the reports of the American Hospital Association, more than 60,000 vacant beds in private hospitals. In fact, almost as many vacant beds now in private hospitals as are being supported by taxation for the tuberculous. In the face of these figures, rather than throw on the last straw and break the taxpayer's back, it would be far better to recommend the use of our private hospitals, which have for so long served their communities and which now are already facing or trying to meet deficits.

The taxpayer is beginning to awaken, and the heavy pressure upon him is already making him sympathetic toward the use of the private hospitals for those who should use them. There is no reason, medical or otherwise, why the private hospital should not accept tuberculous patients. The well-organized staff has represented among its members all phases of medicine. A patient with pulmonary tuberculosis may have some complication which requires the consultation and service of the obstetrician or the gynecologist; the general surgeon may be needed for the removal of an appendix or a gallbladder; the internist may be called for a careful study of the thyroid, or for the treatment of a complicating diabetes; the chest surgeon may frequently be called upon to perform phrenic exeresis or extrapleural thoracoplasty, and so on with all of the specialties in medicine. Therefore, from the standpoint of consultation the organization is complete; from the standpoint of the pulmonary lesion itself, we find the private hospital highly satisfactory.

One objection in the past has been that tuberculosis is a communicable disease and since a ban was established on such diseases in many

private hospitals, the tuberculous patient could not be admitted as such. Although all private hospitals with 100 or more beds have almost constantly, among their patients, open cases of tuberculosis who have been admitted for other conditions, such as emergency surgery and obstetrics, the tuberculous lesion usually does not come to light. The disease among these patients is just as communicable as it is among those who have established diagnoses of tuberculosis. Many times I have traced tuberculosis in students of nursing and medicine to patients suffering from other conditions, but in whom unsuspected tuberculosis also existed. We know how tuberculosis is communicated from person to person; we have learned how to prevent the spread of such communicable diseases and from our knowledge has been developed a communicable disease technic called medical asepsis. In the Charles V. Chapin Hospital of Providence, Rhode Island, this has been in practice with great success for many years. It is in practice in certain private hospitals of this state with very little expense and inconvenience on the part of the hospital and with great advantage to the patients, themselves, and the employees. The technic is simple and can be instituted anywhere. This fact should remove the objections of the communicable disease patient, particularly tuberculosis, in our private hospitals.

No one would think of practicing surgery in the absence of surgical asepsis. The surgeon brings his patient with pyogenic micro-organisms to the hospital. During the operation extreme care is taken to destroy all of those organisms set free in order that they may not contaminate the wounds of patients later brought to the operating room. If such patients have pus discharges, through sinuses, et cetera, after they are returned to their rooms, every precaution is taken to destroy all of the micro-organisms eliminated. In other words, it is just a question of keeping clean the operating rooms, as well as the patients' rooms. While this great care is being taken in one part of a hospital, in another part, patients with respiratory diseases may cough freely and cast off discharges from the nose, throat, and lungs, with very little attempt to prevent the spread of the pathogenic micro-organisms to visitors, employees, or attendants. The hospital is a place where people being attacked by pathogenic micro-organisms are congregated. Therefore, it may easily become a hot-bed for the transmission of disease. Sometimes one hears the statement that on the obstetrical service of certain hospitals there is a far higher incidence of puerperal sepsis than

one finds in the homes in a country practice. The explanation ventured is that the hospital is infested with micro-organisms capable of causing this condition, whereas, in the home they may be less prevalent or entirely absent. This is a serious reflection upon the cleanliness of any institution.

The hospital should operate in such a way, from the standpoint of transmission of disease, to merit the confidence of the public. When a patient goes to the hospital, he should be absolutely assured that he will be so treated that his disease will not be passed on to others, and that while in the hospital he will not be allowed to contract any other communicable disease. Medical asepsis administered with the proper technic offers reasonable assurance of such protection to him, his visitors, and the employees and attendants of the hospital. It is not an uncommon experience to see visitors with acute coryza, bronchitis, or even more serious communicable diseases, enter the rooms of hospital patients with no protection whatsoever afforded the patients. They are helpless. The medical superintendent of a large hospital in this state told me that in a single week three of his patients who were convalescing satisfactorily from other conditions, died of pneumonia, which he firmly believed was carried to them by visitors suffering from respiratory diseases. This and many similar experiences led him to institute medical asepsis.

During the recent influenza epidemic, the following statement appeared in one of our daily papers: "Because of the prevalence of acute respiratory diseases and their harmful effect upon hospital patients, no visitors will be admitted to the———hospital until further notice is given. Visitors will be admitted in the case of extreme necessity only," officials said. The absurdity of such action is obvious. In other words, under ordinary times neither the patients, visitors, employees, or hospital attendants of that institution are offered adequate protection. In most all communities there are ever present sporadic cases of coryza, bronchitis, and other communicable diseases. Every hospital should protect its patients against such cases among visitors by the institution of medical asepsis. The number of students of nursing and medicine who develop communicable diseases from the patients they attend each year is appalling. Much of this could be prevented by the institution of medical asepsis, which simply means keeping the hospital clean.

Our students of nursing should be well qualified to practice their profession when they grad-

uate from first-class schools of nursing. Certainly no girl is so qualified unless she has had sufficient experience with the communicable diseases. There is no communicable disease which lends itself so well to the teaching of medical asepsis as tuberculosis; first, because no disease is more communicable than tuberculosis; second, tuberculosis is so prevalent that every hospital may easily have patients suffering from this disease all the time, whereas, some of the other communicable diseases appear for the most part in epidemic form or are seasonal. Therefore, the instruction in most of our schools of nursing of private hospitals could quickly be very definitely improved by the admission of and the treatment of tuberculous patients as such.

The financial revenue derived by hospitals from such patients can be made very much worth while. If the total amount paid to all hospitals by tuberculous patients sent in by physicians were known, there would be no question in the minds of physicians and hospital authorities that the tuberculous patient is already a considerable source of revenue for private hospitals. The number of patients in such institutions could be materially increased if physicians would refer to private hospitals rather than to tax-supported institutions those capable of paying the usual fees.

There are now large numbers of people attending tax-supported dispensaries who because of their financial status are able to pay little or nothing. They are over-taxing the capacity of the dispensaries to the point of causing serious problems. One problem is that of increasing free dispensary and hospital facilities. One solution of this problem would be for the physicians to open their private offices to many patients who are now going to dispensaries, accepting whatever they can pay, and giving service to those who cannot pay. The tax-supported institutions could well afford to delegate a considerable part of its work to the offices of private physicians and actually pay the physicians, or perhaps better, the medical society a small fee for the care of the poor. This would not only be less expensive for the institution but would be far better for the public. Many vacant beds in our private hospitals could also be used to advantage for such patients with a saving to the taxpayer.

In all probability the best place to develop the true private hospital spirit is in the school of nursing. I regret to say that one of the chief difficulties which many directors of such schools of nursing contend with is the indifference of the medical staff toward the school. To the stu-

dent nurse, the hospital school is her college or university. She looks upon it as such, and if the hospital and its medical staff fail to help the students develop that spirit which is so essential in any institution of learning, it has failed to provide its students with one of the basic phases of their education. It has failed to provide that which will contribute much to the future success of the hospital. Directors of private nursing schools state that staff physicians frequently do not prepare their lectures well. They seem to have the attitude that no matter how much they ramble or how little they say, or how little they demonstrate, it is good enough for the student nurse. In truth, no one can afford to neglect the service or to do mediocre work. Another complaint is that they are not faithful to their work for the school; in other words, they do not set aside the time for the lectures assigned to them in such a way that nothing encroaches upon that time. If when the time comes for the lecture there are not patients in the office, or no house calls on schedule, the lecture is given; if there are patients, the lecture is omitted. The girls meet for their class, the lecturer does not appear and the class disbands. This not only is a tremendous loss of time to the entire group but results in bad morale. This does not apply by any means to all faculty members in our private schools of nursing. There are those who prepare their lectures very carefully; they are punctual and let nothing interfere with their teaching. The truth is, so little time is required of each staff man for this teaching service that there is no imposition to anyone.

The neglect of lectures, moreover, has led to the idea that many of the classes for nurses in a city should be centralized. For example, all of the lectures on surgery or on medicine for all the students in the various schools of nursing would be given by one physician or by a group of physicians in one common meeting place. To centralize teaching of nurses; in other words, to gather them together in large groups for their teaching is bad pedagogy. Institutions of learning have for years tried to provide enough faculty members to keep the classes small. To have several physicians present different phases of the same subject is bad pedagogy. In fact, the small class is ideal because there is opportunity for questioning and free discussion of the subject.

One physician told me that he teaches his specialty in the schools of nursing in four or five different hospitals; that in each one the class is small and he is making an attempt to have the nurses from these hospitals meet in one central

place in order that he may escape the repetition of the lectures. Although this is less objectionable, because this group will be smaller, than the idea of taking all the students in the city to one central place, nevertheless I believe that if he is on so many staffs that it has become a burden to give the lectures in each hospital, he should resign from the faculty of some of them in favor of other men in his specialty.

The only excuse I have been able to see for centralized lectures is on such subjects as are not ordinarily found on the regular curriculum of a school of nursing; for example, the course of lectures on public health given to the senior nursing students of the hospitals of the Twin Cities through the Extension Department of the University of Minnesota. This course is not necessarily designed as one of instruction of the nurses so much as to introduce the field with the thought of stimulating their interest in graduate work. A similar course of lectures, or one supplementing such a course, by a department of health of a city is justified, such as the course offered by the Minneapolis Department of Health.

To centralize all the lectures for nurses, or any considerable part of them, would be extremely dangerous, both to the private hospital and its school of nursing. Students of nursing choose their schools for some definite reason, such as the high standing of the medical staff or the excellence of the work done by the hospital. Whatever the reason is in each individual case, the fact remains that generally speaking the girls who chose a given hospital school of nursing have more confidence in that one than in any other. They believe that the medical staff, and other members of the staff of the school of nursing, are highly qualified to teach them all that they need to know about the subject of nursing. In this confidence lies one of the great secrets of developing the true private hospital spirit. To say to the students that the medical staff members are not capable of providing adequate instruction is to destroy in part, at least, their confidence in the institution. To send them away for any lectures, with the exceptions of the above mentioned, leads them to wonder why their own staff members are not qualified; in other words, it not only ruins the college spirit but it jeopardizes the future of the hospital.

Every alumnus of a school of nursing should go forth from the institution with even more confidence in her school than she had when she entered. Throughout the years of her training, her ideals should have constantly been raised to

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Medical Publicity*

L. Benshoof
Editor, *The Detroit Record*
Detroit Lakes, Minn.

MR. TOASTMASTER, and Members of the North Dakota State Medical Association:

I wish to express my personal appreciation and that of my associates in this movement for the privilege of appearing on the program this evening and discussing the question of ethical "Medical Publicity."

I confess to a feeling of temerity in speaking before your president, Dr. Paul Burton, for he is one of two men who know more about me than I know myself. I furnished the subject for him and one of his associates to make an "exploratory investigation" on one occasion and I do not really know how much inside information he can give. I felt at the time that the fee I paid should insure his lifelong silence, but I am never quite sure of what he might tell the public should I incur his displeasure. At any rate, I feel that I should be absolved from the accusation of practicing self medication, for I did not go to a fellow printer to have my abdomen opened and looked over. Sometimes I twit my medical friends because they treat themselves in the matter of publicity within their own group, when they say we should not even take soda when we have a pain in the stomach.

We have been hearing a lot about New Deals in the past few months and perhaps if all of us appreciated what these new deals are going to mean to our children in the future we would be more enthusiastic. To me one of the most satisfactory things about these new deals is that the depression is making better friends of us all, bringing us closer together. You in medicine and we of the press realize that there is serious work to be done. All of my lifetime, or during the forty years in which I have been engaged in the publishing profession, I have been impressed with the lack of co-operation between your profession and mine. I contend that we represent mankind's two choicest possessions—health and education, but too often we say, "I do not like you" and back you come and say, "I don't like you either." The doctors have not taken advantage of the opportunity of talking to the reading

public, but you may recall that we were praised for helping, fully as much as you in medicine, in eliminating the Baker Cancer Institute at Muscatine, Iowa, and that Brinkley Goat Gland plant at Milford, Kansas. Both were subjected to investigation, and both were submitted to as vigorous an exposure as libel laws would admit. We have felt deeply the lack of contact with your association. I have realized that perhaps we of the press were slow in approaching you on this group contact, but many of you apparently feel that we wish to use you as advertisers, something like chain stores and automobile chain advertising. Nothing is further from the subject.

As a member of the newspaper profession I have for many years contended that the wording of the advertising section of the Medical Code did not justify the rigid interpretation given it, and have felt that some liberalization should be permitted if the press was to have the assistance of the medical fraternity in suppressing quackery in medicine and of protecting the legitimate practitioner. I have known many medical men, I have had to employ them as many do, and I have never had an unpleasant personal experience with a single medical friend, and as the years roll by one after another and I continue to deplore the lack of contact between publishers and the medical fraternity I find almost universally that my friends agree with me. So I felt that, if agreeable to you, I would like to try it out on a group, and after a rather subtle appeal I was asked to address a Minnesota group, the Northern Minnesota Medical Association, that was meeting at Moorhead two years ago. The result of that contact was so favorable that I later went to Minneapolis and met with our editorial group and asked to have a contact set up to see whether our problems could be solved. The whole problem was almost wrecked at the start because the president appointed as a member of my group an antivaccinationist, who came up to the meeting with everything that had been published about antivaccination in many years, and he started a tirade about the absolute futility of using any sort of vaccine or toxin. I let him ramble for about ten minutes and then interrupted and told him that we were holding the meeting to discuss

*Informal address at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1, 1933.

publicity and not the scientific value of antitoxin. That made him angry and I let him talk for another ten minutes, and then insisted that he was getting no further in discussion of this subject. That made him still more angry and he said, "We cannot have any proper discussion with the medical profession for you have no chiropractors or osteopaths here." I agreed to that and said, "Let us take up one thing at a time and try and make friends with the pill rollers and then we can take up the punchers and the rubbers." Afterward, when our permanent contact was set up I took occasion to see that my antivaccinationist friend was not a member of the group.

Since that time we have had three conferences and nothing has given me more satisfaction than the meeting with the committee of the Minnesota State Medical Association and our Association to help them solve this problem of proper, ethical publicity. At the last conference the medical fraternity asked for some concrete examples of what we had in mind, so I went to the advertising department of the St. Paul Press and gave them my ideas, a copy of which I have here, of which I consider proper and ethical advertising for any medical group in America. Whether or not any medical group accepts this as part of any paid medical campaign I am not so much interested in as I am in seeing that we both rise a little above our profession to see if we cannot both rise above these things in serving humanity without pay.

The Minnesota medical group presented a report to their annual convention in which they recommended unanimously the adoption of the proposals made by the Press members of the Advisory Board, and there the matter rests. The Illinois committee made similar recommendations. That was the objective I started out to attain. It was to set up a permanent contact between the two associations so that these matters may be solved. I realize that you charge the press with accepting advertising of patent medicines and many other things which you consider objectionable. I plead guilty to that but, after all, there is a duty on your part in advising us as to the legitimate and the margin between the fraudulent and semi-fraudulent.

The next step took me to Chicago with C. W. Jones, of the Minneapolis Journal, to sit in at a conference between medical and press representatives—the first of its kind ever held. A couple of months later I received a report of the Committee of the Illinois Medical Associa-

tion and it was very similar to the one submitted to our medical conferees in Minnesota.

While in Chicago we took occasion to look into the situation that had arisen between the Chicago Medical Society and the Public Health Institute. Some of you at least are familiar with the fact that since the establishment of that Public Health Institute several of the prominent medical men of Chicago have been disbarred from the Medical Society because of their connection with the Institute. We looked over the Institute and I am sure you do not need me to come up here and tell you about the "new deal" of which Dr. Darrow spoke.

I have been very much interested in reading Dr. Ray Lyman Wilbur's statements regarding the report of the Committee on the Cost of Medical Care, in which some of the most prominent medical men in the United States advocated some socialistic type of group medicine. You doubtless know that the medical profession has received considerable more or less adverse editorial and news comment, much of which we may assume was not based on a firsthand knowledge of the facts by the writers.

I hold in my hand a page torn from the Chicago Herald and Examiner regarding a new institution for medical care which is not unlike the Public Health Institute, and I have information, which comes from a physician from Chicago, that this group has not as yet established themselves on a paying basis, although the proposition has not yet failed.

One of the most interesting experiences which I also had for the first time in my life was when I was asked to sit in at a clinic at the Sand Beach Sanatorium and there I heard our own Drs. Henderson and Wangenstein of the State University both give illustrated lectures on bone surgery. Much of it was over my head in technical phraseology, but still I could go home and tell my readers what great advancement had been made by the medical profession in this particular.

Your only real medium of contact with your potential patients is through the weekly newspaper and there is no reason why you cannot use paid medical publicity to couple up with your professional notices. It is true that the rural practitioners do spend a trifling sum each year with their local newspaper by running a "profession card," but many thousands of the members of the medical profession practicing in the larger cities spend absolutely nothing for publicity, except that of a more or less scientific nature which is published in your technical journals,

and circulated generally among members of the profession only. This must, in my opinion, be enlarged upon by carrying to the man on the street certain facts in connection with health problems which will have a tendency to send him to a legitimate medical practitioner rather than to some "rubber" or "puncher" whose instruction has been more categorical than scientific. Among the things of which I speak are the news articles that do go out by our Association each week. Some of these actually tell the people how to stay away from the doctors, because they tell how acute symptoms may be detected and how to avoid the results, whatever they may be.

One of the men on our contact group is Dr. A. E. Myerding, State Secretary of the Minnesota Medical Association, who was at first quite cool but a good enough scout to be willing to be shown. He was considerably provoked when he found we had visited the Public Health Institute, because he thought we might have been investigating the efficacy of the Wassermann test, or other work they do there. I assured him that we went there only to secure copies of the advertising that had been published, and that we also asked one of the chiefs of the clinic to permit us to be shown around so that we could get the business set-up, but Dr. Myerding was quite provoked to think we had so degraded ourselves as to visit an institution of that type. He later descended from that attitude, and some weeks ago I spent an hour or so with him in my office and found that he has gone into this matter of ethical publicity a little bit closer, and I think the last possible objection has disappeared in my state regarding this contact.

There are so many things that come up in this connection that I could recite them indefinitely. Dr. Myerding told me of an article which had been published decrying the efficacy of the test for bovine tuberculosis. I told him I had not noticed it, and wondered why he did not clip it and send it to me. I would have written that editor and taken him severely to task, for it is evident that we of the press must concede established scientific facts as denoted by advanced medical research. I could not blame Dr. Myerding for feeling that there was at least one newspaper publisher who was living in the past ages when he came out with a column and a half article decrying the tuberculin test for discovering diseased cattle.

The chairman of our medical group at our first conference asked why doctors should go to the publishers for advice on advertising—why not go to a lawyer, or perhaps a garage mech-

anic? I replied that a doctor should consult a publicity expert for the same reason that we of the press consult the nearest and best advised medical practitioner when we desire service in connection with health matters. As I told you, when I wished to have my appendix removed I did not go to a brother editor, but to Dr. Burton and his colleague. I willingly concede that men with this type of experience can render myself and others service of merit, just as I feel that my forty years experience in studying the reaction of the public to the printed word places me in a position to accurately advise my medical friends concerning what they should say, and how to say it.

Dr. Burton was very kind in supporting the idea of a press contact here in your state, as in Minnesota. Nothing would please me more than to have the question of "Medical Publicity" taken up and a state contact committee established. In Minnesota our Advisory Board consists of two metropolitan publishers, two rural editors, and our state secretary. Our medical friends have followed the same plan and their group is made up of two city practitioners, two from the rural areas, and their state secretary.

I rather took Dr. Myerding to task because he had been down in southern Minnesota the night before I saw him, addressing a Parent-Teacher Association meeting with his slides. I asked him if any press men were there. He said he did not know. I told him I thought his effort was largely wasted because his message reached only those within sound of his voice. It is not necessary to go to the press and ask for a big write-up, with a picture on the front page—you do not need to do anything like that, but you should certainly point out to those in charge of a meeting that you are to address that perhaps the purpose of the meeting would be better understood if some members of the press were present so that the message could be published and reach the people.

I think the press contact could be well employed and it would be a great pleasure to me to know that no future meeting of the North Dakota State Medical Association will be complete unless you have some representative of the press there. I might say that so far as any monetary returns are concerned, in Minnesota the only example occurred up at Crookston, where a medical clinic contracted with the paper for a three column advertisement which discusses the economic side only. I do not approve of the type of the advertisement, but some of you may be

(Continued on Page 625)

Diabetes Mellitus*

Frank I. Darrow, M.D.
Fargo, N. D.

THIS PAPER is given with the purpose of directing attention to a disease with a bad reputation, which, we believe, may be easily controlled and, to a large extent, prevented; also to show how a relatively small series of cases, if analyzed, will bring out most of the important points about a disease and its complications. We know neither the cause nor the cure of Diabetes Mellitus and yet in many ways it is one of the most satisfactory diseases from the standpoint of treatment.

The treatment of diabetes is essentially one of education of the patient combined with proper follow-up and the handling of so-called diabetic emergencies.

Urinalysis stands out above all other diagnostic methods in discovering the disease, as well as in its control, once it is found to be present. A knowledge of the sugar value of foods, their caloric content, and the use of insulin is absolutely essential to practically every diabetic. These facts are the bug-bear to the diabetic when first confronted with the idea of learning them. Methods are now simplified so that one rarely fails in finding as satisfactory explanation to even an illiterate patient.

Convenient tables which give the normal calorie requirements for various ages, sex, height, weight and occupation are found in any good diabetic book.

Diabetics do best if they can be molded to normal or ideal physical standards. In other words, if too heavy, reduced, and if underweight, made to gain. Once this is done they should be on as near a normal diet as their particular case demands, considering the severity of the disease, the age of the patient, their occupation and natural disposition. Some individualization will always be necessary due to this factor of disposition.

Standardization of the severity of the disease is best done under a hospital regime, where frequent urine and blood sugar estimations may be made and diets estimated in the most accurate measure available. We believe

this should always be done in children, in coma or impending coma, in pregnancy and in cases with such complications as infectious diseases, goitre, gangrene and surgical diseases. Sometimes this is impossible and we are sure many of these conditions have been successfully handled at farm houses in the dead of winter when moving the patient was impractical. The procedure in educating a patient is really comparatively simple.

From the age, sex, height, weight and occupation a diet proper for the individual is made from tables mentioned before. In very mild cases, particularly if the patient is averse to learning, a qualitative diet may be given. In more severe cases the diet will at first be below their normal requirements, but should be accurately determined and the amount of sugar excreted on such a diet determined. If the diet is at all near the normal requirements and sugar is excreted, insulin will in all probability have to be used at least for a time. With very few exceptions all diabetics should be taught the use of insulin and the necessary paraphernalia for its administration with them at home or as part of their traveling equipment when away from home.

From the number of grammes of sugar excreted in twenty-four hours on an accurately determined diet, the rule of one unit of insulin for each two grammes of glucose may be used. Ordinarily, instead of dividing the insulin into three equal doses, a larger dose is given before breakfast because of the longer fast before this meal and the tendency for the blood sugar to be higher. In undetermined cases the use of insulin may be considered as of value in giving rest to a fatigued pancreas which often recovers some of its lost function. Too low a carbohydrate intake can be dangerous in cases where it is thought that the reserve of glycogen has been depleted. This should be suspected in long standing cases and those who have been without food.

The majority of diabetics may be adjusted to a satisfactory tentative diet in a week or ten days. A longer time is desirable but often unnecessary. To satisfactorily teach a patient

*Read at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1-2, 1933.

all they need to know about urinalysis, food values, the use of insulin, hygiene for diabetics and about diabetic emergencies, generally takes about two weeks. This may be done while their case is being regulated.

It is best to begin with teaching them how to test the urine for sugar. They are then told the fundamentals of food values and educated in figuring calories. The written slip with their trays showing the weight in grammes of each article of food together with its protein, carbohydrate, fat content and calorie value has been found very helpful. Later they should calculate this themselves, and finally make up their own menus. A number of lessons in the diet kitchen actually weighing the food gives the confidence necessary to make them feel more independent.

The theory of diabetes, giving the function of the pancreas, instruction on the use of insulin, hygienic measures, with particular attention to care of the feet, are described. Then emergency measures must be carefully gone over; such as what to do if vomiting occurs, loss of appetite, diarrhoea, or if a cold develops. All of this is easily accomplished by using one of the many good diabetic handbooks or primers. Every diabetic should be supplied with one of these. A diabetic may be told that his condition is largely in his own hands and in our experience the better instructed they are the more frequently they follow the advice of checking up their condition with a physician every three to six months. The majority of patients who do not come in for a check-up regularly sooner or later get lax and come in for help. The usual story is that they kept testing their urine day after day and as no sugar showed up they gradually increased the diet and at the same time tested the urine less often and finally considered themselves cured or at least in no need of taking special care of themselves. Then came the inevitable return of their trouble. One lady of above average intelligence came back the third time with this same story. She finally was convinced "once a diabetic always one" and she has had no further relapse for three years.

Another type of recurrence was in the first juvenile case of diabetes that we treated after insulin was discovered. She was brought into the hospital in coma and made what we called a magical recovery in those days. Her parents were given the instructions and carried them out very well for about two years when she

developed a respiratory infection and came in again in coma. Recovery was again uneventful. One year later she was brought in again in coma with the story that friends had persuaded her parents that "this insulin" was a bad thing and there was a cultist in a nearby town that was curing diabetes right and left. Two weeks off of insulin and on adjustments preceded the coma. This last time the girl was 15 years old and was given her own instructions. Up to three years ago there had been no relapses; we have not heard from her since then. Regardless of how patients are instructed, a certain per cent will succumb to the promises of quack cures. Sympathetic understanding and a kindly attitude will go farther with the patient who backslides or side tracks, than criticism.

Many diabetic experts make the statement that diabetics should not die from their diabetes and may even live longer with it than they were expected to live without it. The question then arises, what are the causes of death in diabetics and, granting that we have largely conquered diabetes, what can we do to avoid complications and to handle concurrent diseases.

Tables of complications in any large series of diabetic cases will show a remarkable similarity of complicating causes of death. Those most common are cardiovascular diseases, infections and coma. This holds true for 18 deaths in a series of 150 cases observed for the past six years.

Gangrene (Five Cases)—Two amputated; two refused amputation; one amputation not advised.

Cerebral Hemorrhage (One Case).

Coronary Death (Four Cases)—Two autopsied.

Coma (Three Cases)—One treated at home; one seen in hospital six hours (Christian Science); one seen three and one-half hours before death (Christian Science).

Following Prostatectomy (Neglected Case)—One case.

Broncho-pneumonia—One case.

Cellulitis (Hand and Arm) Septicaemia—One case.

Large Umbilical Hernia—One case.

Cholecystectomy and Appendectomy—One case.

Leaving out a ten-year-old child first seen three and one-half hours before death, the average age of these cases was 63 years. This probably does not include all the deaths occur-

Bone Tumors*

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THE presence of a bone tumor immediately raises the important question as to whether the condition is malignant or benign. Although there are many borderline cases in which the differential diagnosis is difficult and can be made only by the aid of biopsy, nevertheless there are certain symptoms, subjective and objective, and certain roentgen ray findings which make a diagnosis possible in most cases. It is not my purpose here to review the subject of bone tumors, and I shall not present a classification of them, but rather I shall touch briefly on the more common types with regard to diagnosis, treatment and prognosis. I hope, however, that the data presented may be of aid to those physicians who are confronted only occasionally with lesions of this kind.

OSTEOMA AND CHONDROMA

True osteoma is rare. It is bone-like, and may develop even in structures other than bone. Various names have been given to osteomas; for example, a small osteoma is called hyperostosis, and a large one is called exostosis; the marginal overgrowths about the joint are called osteophytes. There are two varieties of exostosis: cancellated, occurring at the ends of long bones; and eburnated, a hard outgrowth in the flat bones of the skull, chiefly the frontal and parietal. I have known osteoma to develop in the muscles of the neck following sudden pain in the neck associated with chills and fever. As the acute symptoms subsided a round bony mass appeared in the muscles of the neck close to the articulating process of the fifth cervical vertebra but not connected with it. These tumors are occasionally seen in the under surface of the heel, and in this situation are very troublesome. Exostosis occurring at the ends of long bones is commonly encountered in the upper inner third of the humerus and in the lower end of the femur. The growth is troublesome only so far as it causes mechanical inconvenience. Patients are not infrequently seen with multiple congenital exostosis, and removal is undertaken only if the situation and size of the growths are interfering with gait, or with movement, or if they are pressing on nerves and blood

vessels. The tumors seldom, if ever, become malignant.

Chondroma is of more clinical significance than exostosis, because chondroma may be, or may become in reality malignant. It occurs usually where cartilage normally is found. Multiple chondromas of the hand are relatively common and are not malignant. I have known of pure chondromas in the lower end of the femur to become malignant and metastasize and cause death. The histologic diagnosis of chondromas is difficult, but the surgeon should beware of a rapidly growing tumor of any kind, and chondromas particularly should be viewed with suspicion. Bone tumors should be studied individually, and too much attention should not be paid to their classification; the essential point is to determine whether the lesion is benign or malignant.

CYSTS

Solitary bone cysts are not uncommon. They usually occur before the age of thirty; they are in the diaphysis, never invade the epiphysis, are found near the ends of the bones, are symptomless, and grow slowly. The roentgenogram reveals that the tumor is well circumscribed with no periosteal thickening, and its growth is at the expense of cancellous tissue. The tumor may become multilocular. Fracture may be the first symptom and may lead to spontaneous cure. The treatment is essentially conservative, thorough curettage and crushing in of the wall of the cyst and, if necessary, the insertion of a bone graft. Solitary bone cysts are relatively common in the upper end of the humerus and in the lower end of the tibia.

Generalized fibrocystic disease of von Recklinghausen has been recognized for many years. Recently considerable discussion has arisen concerning the etiology of cystic disease of bone because of the fact that a certain unusual condition of the bone, with atrophy as the dominant feature, has been proved to be due to parathyroid disease. Certain investigators in their enthusiasm have misplaced under the head of parathyroid disease many diseases in which atrophy of bone is present. The cystic degeneration of bone of von Recklinghausen's disease may be connected

*Abstract of paper read before the North Dakota State Medical Association, Valley City, May 31 to June 2, 1933.

†Section on Orthopedic Surgery, The Mayo Clinic.

with parathyroid disease, but the condition of the bones in parathyroid disease is more or less typical.

CHANGES IN BONE AND HYPERPARATHYROIDISM

Hyperparathyroidism is a chronic and slowly progressive disease caused by excessive secretion in the parathyroid glands. The clinical features are: (1) high values for serum calcium, (2) low values for serum phosphorus, (3) abnormal excessive excretion of calcium and phosphorus in the urine, (4) pains in the bones, (5) weakness of muscles, (6) roentgenologic evidence of generalized decalcification of the bones with or without deformities, cysts and tumors, and (7) usually anemia and loss of weight. The roentgenologic evidence is that of generalized decalcification of the bones. Camp has described these changes as a uniform miliary granular mottling, best observed in the skull, thinning of the trabeculae in the cortex and areas of subperiosteal absorption in the long bones and phalanges. There may be also single or multiple cysts, deformities and fractures. The results of parathyroidectomy are in some instances astonishingly good. I can recall the case of a man, aged thirty-four years, who presented himself because of a general run-down condition, with increasing weakness, pains in the hips and knees, stiffness, and so forth. The weakness was so extreme that he had difficulty in masticating. The value for serum calcium was high; that for phosphorus was low. The roentgenogram revealed the typical mottled granular condition in the bones seen in hyperparathyroid disease. The result of parathyroidectomy was good as evidenced clinically and by the marked improvement noted in the roentgenograms. Hyperparathyroid disease is relatively rare.

GIANT-CELL TUMOR

Giant-cell tumors are a definite clinical entity. They are not malignant; they are found in the epiphyseal regions, and contrary to bone cysts extend readily into the epiphysis such as the lower end of the femur, the upper end of the tibia, and the lower end of the radius. The tumor may follow trauma. It occurs generally in patients aged less than forty years and the symptoms are pain, swelling and tenderness. Pathologic fracture may be the first symptom. The tumor itself casts little if any shadow, and the trabeculated appearance is due to irregular bone shelves projecting in and around the proliferated tumor. Absorption of the bone is marked, but thinning of the cortex at one spot may allow bulging of the tumor beyond the normal con-

tour of the bone. When the tumor does burst through to the surface, it follows along fascia and muscle planes. The tumor may be very destructive and the entire structure of bone may be replaced by tumor, as is occasionally seen in the knee joint where the whole lower end of the femur may be destroyed.

The treatment of choice is surgical excision; often the tumor can be readily shelled out. The prognosis is particularly good if the epiphyseal cartilage has not been destroyed, for it is possible under such fortunate conditions to shell out the tumor and place a bone graft in the cavity to hasten repair. When the tumor has broken through to the soft tissues and the epiphyseal cartilage is destroyed, the result is not so satisfactory. In some cases, when the lesion is in the lower end of the femur, destruction in the knee joint may be so extreme that reconstructive surgery is not possible and amputation must be resorted to, not because of the malignancy of the tumor but because of the extensive destruction and irreparable injury it has caused.

SARCOMA

Sarcomas are always malignant. They are of various types. Their chief diagnostic point is rapid growth. Trauma is probably responsible for sarcoma in 52 per cent of the cases. In 78 per cent of the cases of sarcoma of bone reported by Meyerding, the growth was present in the long bones of the knee. In 75 per cent of his cases the patients were aged between ten and forty years. The symptoms are usually mild; the pain is boring, rarely becoming severe. Local swelling, local heat and some fever may be present, and the veins are enlarged. It can be distinguished from disease of the joint chiefly by the fact that the joint can be moved without pain. Loss of weight and pallor are late signs. The tumor is fixed and firm, and the condition of approximately 35 per cent of the patients when they come to a surgeon is inoperable. The roentgenogram shows a tumor out of control and breaking through into the soft tissues. It is not circumscribed and it may or may not have the typical sun ray striations. Enlarged veins in the skin are present if the tumor is large. Its chief characteristic may be destruction, but, on the other hand, reparative processes may be going on at the same time.

There may be a history of injury to the extremity and of the formation of a tumor that rapidly increases in size. The condition is not always easy to distinguish from osteomyelitis in the cases in which the onset is associated with

chills and fever. In cases of this type the tumor usually grows rapidly, and is very malignant. Certain cases are easily diagnosed because the tumor is large and the typical sun-ray striations so often spoken of are present. A sarcoma of the sclerosing type may occur in the upper end of the tibia; there is not much enlargement, the roentgenogram showing chiefly increased density of bone. Such tumors metastasize early and they are often highly malignant. Sarcoma is not infrequently confused with Ewing's tumor but the test of radiosensitivity will often clear up this diagnosis. However, as far as prognosis is concerned, that for both lesions is equally bad.

ENDOTHELIOMA

Endothelioma (Ewing's tumor) occurs among patients aged less than thirty years, and the shafts of the long bones are chiefly affected. Pain, diffuse swelling, and sometimes fever are present. Roentgenograms are more or less characteristic. Attention is called to the onion skin appearance or leaf-like formation seen in some cases. The lesion is often mistaken for chronic osteomyelitis. One of the diagnostic tests is susceptibility and response to roentgen-ray treatment. Metastasis occurs early to other bones, to the lungs, and so forth, and the prognosis is poor.

Endotheliomas are not always easily recognized. I can recall the case of a young man, aged twenty-five years, who gave a history of having had intermittent pain associated with some swelling in the lower end of the femur for one year. Roentgenograms revealed a shadow in the lower end of the femur, and on opening into the bone, heavy thick pus with a colon odor was encountered. Naturally it was assumed that the condition was osteomyelitis. However, the wound did not heal readily and what was taken to be granulation tissue formed. On examination of tissue the growth proved to be an endothelioma. Careful treatment with roentgen rays and Coley's serum was given following amputation, but the patient died within two years from metastasis to the lungs.

I can recall another case, that of a boy aged five years, the only son of a physician. The child had a little swelling in the upper end of the femur. Exploration disclosed endothelioma. Under roentgen-ray treatment the boy remained perfectly well for a year, but the tumor recurred ultimately and he died of metastasis involving the spine, lungs and so forth.

METASTATIC CARCINOMA

Carcinoma of the bone is always metastatic and destructive. In several cases I have known patho-

logic fractures to occur and ultimately unite firmly. The patients lived for a considerable time, then metastasis to other bones, and elsewhere developed.

Metastatic tumors of bone are of significance also because they are sometimes confused with primary tumors. The more common origin of metastatic carcinoma of bones is the breast, the prostate and thyroid glands, and the suprarenal glands, although it may originate in any organ. A thorough examination should be made for a primary lesion in all bone tumors of this type.

OSTEITIS DEFORMANS

Osteitis deformans (Paget's disease) occurs among older persons with bowing of the tibias and femurs, and thickening of the femur. The bones become enlarged and trabecular. The cause is unknown and there is no effective treatment. The prognosis is good although fractures may occur. In a considerable percentage of cases sarcoma develops. There is no evidence of hyperparathyroidism in these cases. The condition is not infrequently confined to a single bone such as the tibia, and such cases often lead to confusion. However, the chronicity and the length of time the condition has existed, and the general good condition of the patient are all aids in diagnosis.

CHRONIC SCLEROSING OSTEOMYELITIS OF GARRE

Chronic sclerosing osteomyelitis of Garre is a low-grade, slowly growing inflammatory lesion found in the shafts of the long bones. It causes a boring pain. It may be suppurative or nonsuppurative and there may or may not be necrosis. There is usually slight swelling and increased heat. Roentgenograms disclose uniform spindle-shaped enlargement of the bone with encroachment on the medullary cavity, and the condition may be mistaken for endothelioma. There may be some fever and some leukocytosis. The enlargement of the bone, as shown in the roentgenograms, is sharply circumscribed. It is possible to confuse this tumor with sarcoma, and undoubtedly in some cases amputation has been done unnecessarily. It occurs most commonly in the tibia although fairly frequently in the femur, less so in the humerus and radius and ulna. The treatment consists of guttering the bone and knocking off the cortex over the involved area.

SYPHILIS OF THE BONE

In this condition the periosteum alone usually is affected, but the growth may be osseous. The periosteal type is more common, and a diagnosis of sarcoma is not infrequent. I have known of a number of cases in which amputation had been

advised. Positive results from blood tests, and perhaps a history of a primary lesion usually clears up the diagnosis.

Therapeutic tests should not be prolonged if the response is not prompt. In doubtful cases a biopsy should be made.

DISCUSSION

DR. HARRY FORTIN, Fargo: It is a pleasure to discuss Dr. Henderson's paper. I was associated with him for several years and think I have seen most of these cases.

He brought out the question as to whether a newgrowth is an inflammatory process or a malignancy. There are many classifications. I believe Bloodgood's to be one of the best, and also Meyerding, both offer a good working basis. Even without a classification, given a bone tumor and X-ray findings you can make the diagnosis in the majority of cases, but there is still a small percentage in which we have to depend upon biopsy before we can come to a decision. A short time ago a young man was sent to me with swelling of the tibia and X-ray examination showed what I considered a typical giant cell tumor with trabeculation and striae running through it. I told the family I thought it was a giant cell tumor that could be removed and bone grafting done, but still that it might be malignant. On removing the growth I found a typical giant cell tumor. Dr. Henderson says these are benign but I think a small percentage are malignant. Just to be sure I sent specimens of this tumor away and found it to be a giant cell tumor with malignant changes, Grade III, with a prognosis of about eighteen months.

Dr. Henderson mentioned amputation. If it is a proven case of real osteogenic sarcoma I think amputation is the best treatment. Otherwise these patients suffer severe pain and become morphine addicts. There are some cases of at least five-year cures following amputation and we can at least offer them that.

DR. FRANK I. DARROW, Fargo: What is the comparison as to results of surgery and roentgenotherapy in giant cell tumor?

MEDICAL PUBLICITY

(Continued from Page 617)

interested in the wording. (Presented various copies of advertising).

I sincerely hope that you will follow the precedent we have established in Minnesota, and appoint a committee to contact with the state editorial association. I am sure that you will find the North Dakota publishers in a very receptive mood, and if you have the same experience we have had in Minnesota you will be surprised and delighted at the interest which each will develop in the other, when a better understanding is attained of the purposes of both.

I wish to reiterate my personal satisfaction at being granted the privilege of appearing here, and I hope that I have proved to you my sincerity in this whole movement. If I live for 150 years I never expect to receive enough revenue from the medical profession in advertising for the expense I have had during the last year and a half, so it is in no sense a financial proposition.

I thank you.

THE SPIRIT AND THE REVENUE OF THE PHYSICIAN AND THE PRIVATE HOSPITAL

(Continued from Page 614)

higher levels. No one but the members of the faculty are capable of accomplishing this. If this function of the faculty is performed, each graduate of the school will constantly refer back to her college days, will always speak of her alma mater in the highest terms and will always be ready to promote the welfare of her institution. The future of any hospital will depend much upon the gradually increasing number of its graduates serving as missionaries in the field. Therefore, let us not develop or permit the development of any situation which will ruin or even decrease the confidence of the students of our schools of nursing in the institutions of their choice.



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CAROTENE AND VITAMIN "A"

Confusion seems to exist in the popular mind about the relationship of Vitamin "A" and carotene. They are not synonymous. Carotene is a precursor of vitamin A and is found in greatest richness in plants exposed to light. On the contrary, vitamin A does not occur in plants as such, but only in animal organs and products. Animals, however, cannot produce it within their organisms; it must be supplied to them in their food either as such or in the form of a precursor. It is believed that carotene is changed in the liver by having its molecule split in two and a molecule of water added to each half.

Vitamin A has been termed the "anti-infective" vitamin and many have assumed that an abundance would protect against infection. This, of course, was going too far as there are many other errors of diet that predispose to infection. At most we may say that its deficiency increases the liability to infection, and yet up to the present even this is based upon animal experiments not yet applied to man.

It must be admitted, however, from these experiments that a supply of vitamin A-rich food of adequate amount is essential in every diet. Halibut liver oil, and the products of the cow, particularly golden yellow butter, have been shown to possess a large vitamin A potency. Vegetables of deepest green, yellow or orange,

appear to furnish the richest source of the vitamin precursor.

The cow being such an important and universal factor in the production of this vitamin should, therefore, have early instruction in spectroscopic diet selection. At this time, when an early repeal of the 18th amendment seems imminent, it may be considered permissible in this severely sober and highly scientific publication to state that the formula of vitamin A is $C_{20}H_{29}OH$, an alcohol. Isn't that just like nature, though?

A. E. H.

ROUTINE POST-PARTURITION BLOOD COUNTS

There is one simple procedure which if adopted in all modern hospitals, would add materially to the comfort and happiness of a good number of patients. It is simply a routine practice of having the red blood count taken in all maternity cases, before those patients are dismissed from hospital care. It is assumed, of course, that a previous record was made at the time of admission.

After following this procedure for the past three years, we have been impressed with the percentage of cases showing a low count who would otherwise be dismissed as being normal.

The query arises, how much partial illness following childbirth is generally ascribed to injuries during that time? How much lassitude and

lack of energy, with all the attendant complaints, might be relieved by a thorough check up of the blood condition?

We have made it a rule in all cases where the blood count was at all below normal, to administer large doses of ferrous carbonate (and I think emphasis should be placed on the size of the doses) ten to twenty grains three times a day in all cases where the pernicious type of anemia does not exist; the results have been extremely gratifying to all concerned.

This may seem like a small matter, but we are confident that much discomfort and unhappiness might be avoided by following out this simple procedure.

R. J. J.

WILLIAM BEAUMONT

This year we are observing the centenary of the publication of Beaumont's epoch-making study of gastric function, made on Alexis St. Martin, a young *voyageur* who had received an accidental gunshot wound of the left chest with a gastric fistula persisting throughout the remainder of his life.

As a result of his experiments Beaumont was able to establish certain basic principles in the physiology of the stomach, the truth of which has been verified by later and more elaborate research.

The most amazing thing about Beaumont's work is that he was able to arrive at these accurate conclusions by the most primitive methods, indeed he was largely dependent upon the use of his five senses and the crudest appliances and reagents. His findings, set forth in simple, direct language which admits of no misinterpretation were published at Plattsburgh in 1833 in a book of 280 pages entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion." Like many other epoch-marking discoveries which ran counter to established doctrine these efforts were not received with unmixed acclaim. Condie, a contemporary critic, expressed the regret that this opportunity for conclusive research had not fallen into more competent hands.

Others went so far as to accuse Beaumont of having willfully interfered with the healing process in order that he might continue the experiments. Congress denied his request for funds. St. Martin was ridiculed as "the man with a lid on his stomach" and became increasingly difficult to manage even though liberally paid and cared for out of Beaumont's own pocket. But the truth prevailed and today, undimmed by the brilliant superstructure of Pavlov, Cannon and Carlson,

the fundamental facts established by the obscure army surgeon, William Beaumont, remain unchanged. It is a moving story of an observing, determined mind grasping an unusual opportunity to the great enrichment of medical science.

G. C.

THE WILLIAM BEAUMONT MONUMENT

The New York Academy of Medicine honored itself by devoting the first fall meeting this year, October 5th, to a celebration of the One hundredth anniversary of the publication of William Beaumont's "Experiments and Observations on the Gastric Juice and the Physiology of Digestion."

Those who have spent a vacation on Mackinac Island will doubtless remember how while strolling, perhaps quite accidentally, they came upon a small but impressive stone, surrounded by a simple enclosure, located on the slope of a hill overlooking the village where Beaumont did his work and in commemoration thereof. The Michigan State Medical Society placed it there.

It was while Dr. Beaumont was stationed here as an army officer that Alexis Saint Martin, of Mackinac, Michigan, came under his care. Saint Martin had received a full charge of buckshot in his left side from a gun whose muzzle was only a few feet away, destroying soft parts, fracturing ribs and entering lung and stomach. In the course of a year, healing was complete except for the stomach, and a few years later Beaumont entered into a contract with Saint Martin which made it possible for him to carry on extensive studies in the processes of digestion. This Beaumont-Saint Martin contract is an interesting document in itself.

Beaumont has well been called the pioneer physiologist of this country. He was doubtless the first one to have obtained the gastric juice from a living person. The experiments and results of his observations, 230 in all, were recorded with a simplicity which characterized his work as that of a true scientist devoid of embellishments and evidence of self-esteem. And so this simple cenotaph is in keeping with an unassuming life and with his own words that "truth, like beauty, when unadorned is adorned the most."

A. E. H.

TUBERCULOSIS IN HENNEPIN COUNTY

The campaign now being waged in Hennepin County against tuberculosis is the most widespread and advanced step that has ever been

taken in tuberculosis control in this vicinity. The encouragement lies in the fact, first, that the Minneapolis Health Department, directed by Dr. F. E. Harrington, the Hennepin County Tuberculosis Association, with Dr. F. A. Erb as president, and the Hennepin County Medical Society, with Dr. C. A. Stewart as president, have all joined forces in this campaign. Second, they are using the most modern and by far the most satisfactory methods of finding tuberculosis that have ever been known to the medical profession. They are beginning with the tuberculin test. This test is highly specific but like all other biological tests is not infallible. The case with tuberculosis who does not react positively is so rare as to be almost insignificant.

Not long ago we believed that approximately 100 per cent of young adults were sensitive to tuberculin and, therefore, would react positively to the test. Observation has shown that there has been a very sharp decrease in the incidence of positive reactors among children and young adults in the past ten or fifteen years. In fact, only approximately thirty per cent of the students entering the Universities of Wisconsin and Minnesota react positively. Obviously, the lower the incidence of positive reactors the more valuable is the tuberculin test.

The groups engaged in this campaign are providing each member of the Hennepin County Medical Society with a tuberculin syringe, needle, and Koch's Old Tuberculin in the proper dilution. All of this is without cost to the physician. The tuberculin provided is in a dilution of one part of tuberculin to 999 parts of physiologic salt solution. The dose to be administered intracutaneously to each patient is one-tenth of a cubic centimeter of this solution, which contains 0.1 milligram of tuberculin. In this dilution, tuberculin is without harm to the patient, whether or not he has tuberculosis. It must not be confused with the old subcutaneous test, which was administered in a large dosage with the thought of producing constitutional symptoms. That test was harmful, but the amount used in the intracutaneous test is harmless. When the test is definitely positive, an area of edema appears in about twenty-four to forty-eight hours at the site of the injection. This is often surrounded by a halo of hyperemia. It is the area of edema which is significant in interpreting the test. If this is absent, even though hyperemia is present, the test is usually considered negative.

Numerous attempts have been made to rate the tuberculin test to one, two, three, and four plus, but such grading is not of particular sig-

nificance in diagnosis so far as we know at this time. A positive tuberculin test, whether in a child or an adult, gives us two significant facts: First, that individual has been in contact either directly or indirectly with some person or some animal suffering from tuberculosis or acting as a carrier and spreader of tubercle bacilli. This fact is an extremely important one, since tuberculosis often exists in unsuspected form. An examination of the associates of positive reactors often uncovers frank cases of the disease. Therefore, whenever we find a positive tuberculin reactor, we should immediately attempt to locate the source.

The second significant fact which the positive tuberculin test provides us is that tubercle bacilli have gained entrance to the body, have found lodgment, and have set up disease by way of tubercle formation. When the test is found positive on first examination, it does not measure how long tubercle formation has been present; the test alone does not point out whether the tubercles are located in the lung, brain, or some other part of the body; it does not gauge whether the tubercles are microscopic in size or whether they are sufficiently large to take the life of the individual in a short time; the test does not indicate whether the tuberculous lesions are completely under control or whether they are progressing; the test gives us no information concerning the re-infection and destructive type of disease, since it became positive with the development of the first infection type. Therefore, such questions must be answered by other phases of the examination.

Inasmuch as tuberculosis more commonly attacks the lungs and the lymph nodes of the chest than any other part of the body, and since the chest lends itself better to X-ray examination than most other parts of the body, our next step is to make an X-ray film examination of the chest of all positive reactors. Unfortunately, in the detection of the first infection type, often called the childhood type when located in the lungs, the X-ray film is such a coarse screen that it brings to light only a small percentage of lesions. This is not a significant point because the first infection type of lesion is very benign; it rarely if ever kills directly. However, it harbors living and virulent tubercle bacilli over long periods of time, perhaps in most cases, the lifetime of the individual. Moreover, it results in sensitiveness or allergy of the tissues to the products of growth of tubercle bacilli. Therefore, after allergy appears, if the cultures of tubercle bacilli contained in the old primary foci escape into the

blood stream, meninges, or the bronchial tree, re-infection type of tuberculosis is very likely to make its appearance. If into the blood stream in large numbers, miliary tuberculosis is often the result; if into the meninges, tuberculous meningitis very frequently develops; if into the bronchial tree, chronic pulmonary tuberculosis is very likely to develop, and so on in the various organs of the body where these free tubercle bacilli find lodgment.

Because of the allergic condition of the tissues, tubercle bacilli taken into the body from outside sources, through further exposure to open cases of tuberculosis, also are dangerous in that they frequently cause the re-infection type of disease. In the re-infection types of an acute and highly fatal nature, such as meningitis and miliary disease, the X-ray film is of little value. The diagnosis is often made by other phases of the examination. However, when chronic re-infection type of tuberculosis develops in the lung, the X-ray film is of great value. It frequently leads to the detection of the disease months and even years before physical and laboratory examinations are of much, if any, avail. After all, it is this chronic re-infection type of disease in the lungs we are seeking, since there is little to be done in cases of meningitis and miliary tuberculosis after it is diagnosed, and since in the vast majority of cases no treatment is necessary for the first infection type of disease. The chronic re-infection types of disease in the lungs are significant from three points of view: First, they have a strong tendency to progress and ultimately jeopardize the health and life of the host. Second, as they progress they usually eliminate tubercle bacilli which the host may transmit to the bodies of human associates. Third, there is often a long period after they can be detected by tuberculin test and X-ray before symptoms appear. It is

during this period when treatment can be administered most successfully. The vast majority of these early cases can now be treated through collapse therapy and modified living without losing much or any time from their work. On the other hand, if they are not treated, many of them go on to extensive disease, spread their bacilli to others, require long periods of absence from work, cost the taxpayers huge sums of money, and more often than not ultimately their disease terminates fatally.

The method now being recommended to the physicians of the Hennepin County Medical Society is fundamentally sound and is a standard method. Members of the medical profession must not despair after examining one hundred to two hundred patients to find that they have detected only one or two patients with clinical or re-infection type of tuberculosis. This is about the percentage found in most communities, but to find this number is worth all the time and effort, because tuberculosis is a communicable disease. The recommendations of those in charge of this campaign are not new; in fact, this method is now being employed in many cities, both large and small. In Minneapolis, the method has been tested for more than twelve years by a small group of physicians who have become more enthusiastic about it as the years have passed.

The most striking feature of the Hennepin County campaign is that the diagnostic and therapeutic work is to be done in the offices of physicians, where all work of this kind should be referred. The committee in charge of this campaign is deserving of the highest praise because of the vision and sound judgment of its members in the selection of the aids it has put into the hands of the individual members of the entire medical society.

J. A. M.

Buy Christmas Seals



Fight Tuberculosis

Proceedings Minnesota Academy of Medicine

Meeting of October 11, 1933

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, October 11, 1933. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the president, Dr. C. D. Freeman, St. Paul.

There were fifty members and one guest present.

Minutes of the May meeting were read and approved.

The scientific program was as follows:

DR. S. E. SWEITZER (Minneapolis) presented the patient and reported the following case of

LOCALIZED MYXEDEMA

Mr. C., aged 62, (patient of Dr. R. M. Pederson) developed a goiter in 1916 and was operated by Dr. Gilmore, of Bemidji, in 1917. A return of the goiter necessitated a second operation in 1926 and this was done at Rochester.

About 1931 the patient noticed swelling of both lower legs. This slowly disappeared but left a localized swelling which still persists. Many nodules and flat hard plaques are to be found on both lower legs. Biopsy showed myxedema. Basal metabolism at present is plus 65. Blood shows hemoglobin 70 per cent, white count 7,600. The eyes show slight exophthalmos. Other findings are normal.

This condition was written up by O'Leary in 1930 and by Stokes and Pillsbury in 1931. Recently Ingram reported a similar case. Including his own case, he was able to find only 26 cases reported in the literature. The analyses of Pillsbury and Stokes showed that these cases fall into two groups: (1) those characterized by nodular infiltrations variously distributed to the face, arms, back and scrotum, and (2) those in which are found plaques limited to the pretibial areas and in which the development of manifestations in the skin is associated with exophthalmic goiter.

DISCUSSION

DR. ARNOLD SCHWYZER (St. Paul) I think this is a very unusual case, in that the man has a plus 65 metabolic rate and a pulse of only 94, and no tremor. It does not look like a very toxic case. I believe it would be a good idea to have that basal metabolic test made over and see if it is really that high. If the rate is plus 65 it certainly is a very rare case. It makes one feel that there must be some other function in the

thyroid than just the production of thyroxin, for here there is such a high metabolic rate, and there is also a myxedema which is usually cured very quickly with doses of thyroid. It is strange that he could have so much myxedema left. Is it not possible that there might be some other condition that would make a local change like myxedema, but not directly dependent on the thyroid? I think it worth while to take another basal metabolic test.

DR. F. R. WRIGHT (Minneapolis): The fact that this man was operated, his thyroid removed, and then developed his myxedema would lead to the suspicion that there may be some other condition, unknown, which causes myxedema.

DR. SWEITZER: An interesting fact about this patient is that at Rochester they had seven of these cases. Dr. O'Leary wrote an article on the subject. In the cases he described, the patients had as high as plus 50 metabolic rate after operation. In this case we tried Lugol's solution, four minims a day, but it pushed the heart rate way up and we had to stop it. I went over the literature quite thoroughly. Stokes and Pillsbury had collected 22 cases from the literature and had three of their own. Some of the cases did well under thyroid and some did not; some were left alone, nothing was done for them, and after a while the myxedema disappeared by itself. They thought possibly there was some interrelation between the thyroid and other glands that produced this myxedematous condition in the skin. So far as I could find out, they do not really know very much about it.

One would think this man should have a low basal, but he has a high basal metabolic rate. Two biopsies have been made and in one of them the section was almost pure slime; there was no bleeding, just a little oozing.

The reason I brought him here tonight is that, when I showed him at a recent meeting of the Minnesota Dermatological Society, a doctor from Superior saw the patient and said he had at that time a patient almost exactly like this man. I wondered if we were not missing some of these patients. This condition might not be so rare as we think. Sometimes when we find a condition we think rare, and report it, we hear of other cases just about like it.

DR. BERTRAM S. ADAMS (Hibbing read his inaugural thesis on

GALL BLADDER DISEASE

DISCUSSION

DR. MAX HOFFMAN (St. Paul): My thesis before this Academy was also on gall bladder disease. At that time I reported some 155 cases operated upon because of a history of gall bladder symptoms. In this group over 90 per cent showed definite pathological changes. Dr. Adam's group of cases also showed a large percentage of pathology. He, too, emphasizes the importance of the history in making the diagnosis. Physical findings rank second.

In this connection I would like to mention a physical sign indicating gall bladder pathology that has recently come to my attention. In the presence of gall bladder disease, on inspiration there is definite tenderness below the costal margin on a light tapping with the ends of the fingers. On expiration, this tenderness disappears. Peptic ulcer cases do not present this sign. It differs from the usual method of examining for gall bladder trouble inasmuch as the percussion is light and the tenderness is elicited only during inspiration.

DR. R. T. LAVAKE (Minneapolis): I would like to hear some discussion as to the present opinion on the relative merits of cholecystectomy and cholecystotomy.

DR. ARNOLD SCHWYZER (St. Paul): As to drainage of the gall bladder, I may be inclined a bit too much toward one side as, in about the last 400 cases, I have not drained one, except perhaps in a very exceptional case. I remember one case where a surgeon did not feel that he should take out the gall bladder, but simply removed three stones that were about the size of the yolk of an egg. He did that in August. The woman later had trouble, and in the next February he brought the case to me because of continued pain and fistula. When I went in, there were four stones just about the size she had had before. They could not have been overlooked. That shows again the well known fact that large stones can re-form inside of six or seven months after simple emptying and draining of the gall bladder.

Conditions where I feel that drainage may be advisable do occur rarely: for instance, in a very bad condition of the heart, let us say in the presence of a gangrenous gall bladder: and still I must admit that in recent years I have taken out every one of these too. And they seem to have done better than I dared hope for. One case, however, had an embolism. Would it have been avoided by simple drainage? It is very questionable. There was a severe coli infection.

About a week or ten days ago I looked up my cases of embolism in a book in which I list my operations. There are the last 3,200 cases in that book, and in that group there were three embolism cases followed by death. The one bugbear we have in gall bladder operation is that the patient may have an embolus afterwards: but, even in the very acute cases, I feel like taking the gall bladder out. In these cases it is good if we can get along with a small incision. Of late I have made a new kind of incision. First, an ordinary longitudinal incision is made; then, after dividing the outer rectus sheath, I pull the rectus out and split the transverse fascia horizontally. In that way, in closing the wound, the rectus muscle falls over the transverse sutures. I have done that in 22 cases. We were able to let the patients get up sooner, some getting up the day after operation, and the average being four days.

JOHN CHAPLIN BARTON, M.B., winner of the prize for the best piece of original investigation by an under-graduate of the University Medical School, read his essay and was awarded the annual prize of \$100. His essay was entitled:

THE DISTRIBUTION OF INTRANUCLEAR
INCLUSION BODIES PRIMARILY
INVOLVING VASCULAR
ENDOTHELIUM

Abstract

I am condensing my paper in order to cover in the shortest possible time the most essential features of it.

First, I should like to say something about the present concept of virus diseases. It is a well-established fact now that in virus diseases, the virus grows intracellularly and produces changes in the cell recognizable as inclusion bodies. These inclusion bodies may be either cytoplasmic or intranuclear. Recent information indicates that cytoplasmic inclusion bodies, while they contain the virus, represent largely cellular material, inasmuch as incineration shows the inorganic material to be concentrated. Intranuclear inclusions do not show this inorganic concentration. Both types of inclusion bodies are quite resistant to trypsin digestion, showing at least a certain proportion of living substance to be present. Furthermore, the infective nature of the virus is not destroyed by this digestion.

We are primarily concerned here with intranuclear inclusion bodies; and these, like other inclusions, are acidophilic and are recognized in section by their staining red with eosin-

hematoxylin or Giemsa stains, whereas nuclear material generally stains blue.

Now, something about the particular disease used for this study—fox encephalitis. Fox encephalitis was first described by R. G. Green in 1926 and has been extensively studied since. This disease occurs on many fur farms in endemic and epidemic form and is undoubtedly imported from the wild. The incubation period is from four to five days. The onset is sudden, the animals sleep much and convulsions and paralysis are commonly found. The course is acute or chronic and the disease may terminate within 24 hours or may remain with the animal for months. The microscopic pathology reveals the same findings found in cases of human encephalitis—petechiae, lymphocytic infiltration about the vessels, lymphocytic nests, etc., are present in the brain. The infective agent of the disease has been shown to be filtrable.

As previously stated, the inclusion bodies found here were all intranuclear and were discovered only after long investigation, probably because of their peculiar distribution not associated with nerve cells. It was in the endothelial cells of the blood vessels of the brain that they were first demonstrated. One might mention here that this was the first time and the only disease in which inclusion bodies have been found in endothelial cells. Subsequently, inclusions were found in ependymal cells, pia-arachnoid cells, kidney, adrenal and liver. It was in order to determine the general distribution in these organs that this quantitative study was undertaken.

I will mention briefly the general technic of investigation. Two groups of ten animals each were considered; one of experimentally infected foxes and the other of foxes which had acquired the disease naturally. All those selected for the experimental group were injected with virus by puncture into the cisterna magna. Then in every instance, before the sections of these animals were used for study, the microscopic pathology was previously determined as characteristic of encephalitis. Sections of the brain, liver, adrenal and kidney were used. The sections from the brain were selected from the various topographical portions, i. e., frontal, temporal, basal, ganglion, etc. Sections were cut at eight microns and stained with eosin and hematoxylin. Each section was completely surveyed under oil immersion lens and only definite inclusion bodies were counted and recorded. Then, using a lens and mirror system, magnified images of the various sections were projected and measured by means of a filar-wheel micrometer. From the area thus

gained, from its known depth of eight microns, and from the standard magnification used, the actual volume in cubic millimeters could readily be calculated. It was then easy to find the number of inclusions per cubic millimeter in each section.

It will only be necessary to mention those results of this investigation that would be most important and mean the most to this group. Approximately 5,000 inclusions were found in each group—natural and experimental. About 75 per cent of these 10,000 inclusions were located in vascular endothelium. This would seem to indicate a certain selectivity in virus diseases for this cell type. In addition to finding inclusion bodies in the endothelial cells of the body, they were at this time discovered to be present in the cells of the pia-arachnoid and hepatic cord cells. As one might expect, the inclusions were more generally distributed throughout the various cell types of the body in the experimental group than in the natural group. That is, the liver, pia-arachnoid and ependymal cells contained more inclusion bodies than the same structures in the natural group. On the other hand, in the natural the inclusions were largely concentrated in the endothelial cells—about 90 per cent appearing there. The pia-arachnoid cells in the experimental group showed a much higher incidence of inclusion body formation than the same cells of the natural group. This, no doubt, is due to their proximity to the point of injection of the virus.

Inclusion bodies were found in the ependymal cells only in the experimental group and here again the direct introduction of the virus into the spinal fluid is undoubtedly the cause. The hepatic cord cells were only slightly affected in both groups and the inclusions found in the kidney were also few and entirely confined to the endothelium of the glomerular capillary loops. In the brain, the topographical parts most affected were the basal ganglion and surrounding areas. All told, about 90 per cent of all the inclusion bodies counted were centered in and about the central nervous system. This bears out very well the general pathology of encephalitis.

It is hoped that this new distribution of inclusion bodies may offer new possibilities in the investigation of human encephalitis.

DISCUSSION

DR. MOSES BARRON (Minneapolis): I would like to ask whether any studies have been made in other diseases of the human, similar to the present study, to ascertain what inclusion bodies are present in the cells. He states that the virus was a filtrable virus. Did he study the material

to establish that it is a filtrable virus by using the filtrate only from Berkefeld filters, or did he use the macerated tissue?

DR. BARTON: As far as the study of inclusion bodies in the human is concerned, I don't believe there has been a great deal of work done in that line. We have looked over some sections from human encephalitis for inclusion bodies but have not been able to find them. Whether this was due to difference in staining we do not know. Some one in St. Louis has studied sections taken from human dead of encephalitis during the recent epidemic there—and claims to have found inclusion bodies in the kidney—but her work is not available for study.

In regard to the filtrate, we took foxes dying on fur ranches, autopsied them, and removed the brain sterilely—saving a piece of it for microscopic study. Under the microscope these sections were diagnosed as encephalitis. Then the steril brains were macerated in salt solution by use of a homogenizer, centrifuged and supernatant fluid put through a Berkefeld filter. We then injected the filtrate into the cisterna magna of other foxes and reproduced the disease.

DR. BARRON: Have you studied infantile paralysis in the human for these inclusion bodies? It should not be difficult to obtain material for such a study.

DR. BARTON: Some work has been done on that, but no inclusions have been found.

DR. JOHN BROWN (St. Paul): You said, as I recall, that the brain contained a large number of these inclusion bodies. Does that mean they have a selective action for brain cells, or were they found in connective tissue or neuroglia tissue?

DR. BARTON: I referred to the endothelial, pia-arachnoid and ependymal cells in the brain—taking these as a group. We found no nerve cells affected nor any other type of brain cell except the three types mentioned.

The meeting adjourned.

R. T. LAVAKE, M.D.,
Secretary.

SOCIETIES

TRI-COUNTY MEDICAL SOCIETY

The meeting was held at the North Dakota State Tuberculosis Sanatorium at San Haven on October 13th.

The forenoon program was taken up by a demonstration, by fluoroscopy, of several cases of lung compression. Also, Dr. Howe did pneumo-thorax injections on eighteen patients. Dr. Howe seemed very well versed in

his line of work and his pneumo-thorax technique was excellent. The discussion on this work, as well as that on thoraco-plasty and phrenicectomy engaged in by the operator, members and visitors, was interesting, illuminating and very much worth while.

During the luncheon, which was served at the institution, a general discussion went on upon the various types of tuberculosis.

After lunch, Dr. Howe exhibited a number of X-ray films, giving his interpretation of various types of non-tubercular, childhood, and surgical diseases, including phrenicectomies and thoraco-plasties. A puzzling film was shown which showed two different fluid levels in the pleural cavity. No satisfactory explanation could be given by anyone present of this peculiar pathological condition. A number of questions were asked and a lively discussion was engaged in throughout the demonstration. The last part of the program was an observation of the effects of the Mantoux test given forty-eight hours previously to a group of Boy Scouts. Not one of the boys showed a positive reaction.

Dr. Chas. MacLachlan made a very appropriate suggestion in urging one or more members of the various medical district societies to train themselves to do pneumo-thorax work. At present, he stated, there are only three large centers where this work is done. Some of the arrested and the apparently arrested cases taking pneumo-thorax injections at the Sanatorium are discharged from time to time due to lack of institutional accommodation. These patients are obliged to make trips at intervals to one of those centers for refills. For that reason, he suggested the advisability of one or more members of each medical society qualifying for this type of work. He invited medical men of the state to attend the Tuesday and Friday morning pneumo-thorax service and fluoroscopic demonstration classes to qualify themselves as technicians for pneumo-thorax instillation. He felt that having at least one man in each society district able to do this work would save individuals or counties much cost of transportation otherwise required. He offered the state's accommodation for meals and, if necessary, beds for those coming from a distance.

We believe this to be a very important service and well worth serious consideration by district societies who are not near those centers where this work is done.

DR. H. VAN DE ERVE,
Secretary.

NEWS ITEMS

Dr. Clarence Steffes, Turton, is now located at New Effington, S. D., where he will continue general practice.

Dr. L. M. Roberts, Little Falls, Minn., has been named president of the Minnesota State Sanitary Conference.

Dr. D. W. Gross, of Iroquois, has decided to locate at Wessington Springs, S. D., and will continue his general practice.

Dr. John R. Nagle, formerly in practice at Watertown, S. D., died recently at Worland, Wyo., after a brief illness of pneumonia.

Dr. Frank E. Balcome, who has been in active practice in St. Paul for over thirty-five years, died last month after a short illness of a few weeks.

Dr. M. J. Lindahl, Winthrop, Minn., will open his office at Rushmore for general practice. The doctor is a graduate of the University of Minnesota.

Dr. William J. Mayo, Rochester, has crossed the Atlantic ocean more than thirty times and his travels have taken him to nearly all of the foreign countries.

Dr. H. R. Hummer, former superintendent of the asylum for insane Indians, at Canton, has moved to Sioux Falls, where he will resume general practice.

Dr. Horace Newhart, Minneapolis, was the guest speaker at a meeting of the Chamber of Commerce, Faribault, when he delivered an address on "Hard of Hearing."

Announcement of the engagement of Dr. Wallace P. Ritchie, St. Paul, to Miss Alice R. Otis, of that city, has been made, with no date as yet made for the wedding.

Dr. M. C. Jorgenson was a recent guest speaker before the Cosmopolitan Club at Watertown, S. D., his subject being "The Importance of Blood Pressure to Health."

Dr. O. W. Johnson, a graduate of the University of North Dakota and the Bellevue Medical School, New York, has opened offices for general practice at Rugby, N. D.

Dr. C. A. Stewart, president of the Hennepin County Medical Society, was one of the speakers at a meeting held at Duluth recently, in behalf of the crippled children of that city.

The Red River Valley Medical society held their October meeting at Crookston, with a good attendance. Drs. J. F. Norman, and C. L. Oppgaard were guest speakers on the program.

Dr. Howard McL. Morton, Minneapolis, bid farewell to his hosts of friends, and has departed for his future home in New Jersey, where he will continue his writings and literary investigations.

The Stutsman Medical Society recently tendered a complimentary banquet to Dr. Helena K. Wink, at Jamestown, N. D. Dr. Wink has been in

active practice in North Dakota for over fifty years.

Dr. A. A. Whittemore, who has been at the head of the state department of public health, at Bismarck, for the past ten years, has moved to Bowman, where he will resume general practice.

Dr. Vernon L. Hart, formerly Surgeon-in-charge of the Division of Orthopedic Surgery of the University of Michigan and the Dayton Clinic, is continuing the practice of the late Dr. Emil S. Geist of Minneapolis.

Dr. B. L. Pampel, president, and Dr. E. G. Balsam, secretary of the Montana State Medical Association, have recently visited the leading cities of that state in the interest of the work being done by the State Board of Health.

The Lyon-Lincoln Medical Society held their first fall meeting at Marshall, Minn., with two splendid papers being presented, Dr. S. W. Harrington, Rochester, "Breast Tumors," and Dr. J. G. Mayo, Rochester, "Functional Dyspepsias."

Dr. T. S. Pryse, who had been in active practice at Dawson, N. D., for over 30 years, passed away last month after an illness of some months caused by heart trouble. Dr. Pryse was 62 years of age and a graduate of the University of Kentucky.

Dr. W. A. O'Brien, of the University of Minnesota Medical School, will be at the head of the 27th annual sale of Christmas Seals for Minneapolis. For many years Dr. O'Brien has been one of the leaders in tuberculosis work in Minnesota.

At the meeting of the Minnesota Academy of Medicine held on November 8th, two interesting papers were presented, "The Eye in Cardiovascular Disease," by Dr. Arthur E. Smith, and "Some Experience in Surgery of the Colon," by Dr. Alex R. Colvin.

Dr. C. O. Estren, Fergus Falls, Minn., who recently returned from Chicago, where he attended the American College of Surgeons, states that 700 physicians in Chicago are receiving help from charitable organizations. Many are actually in the bread line.

A large attendance of members were at the sixth annual meeting of the Minnesota Medical Alumni Association held last month at the University Hospital. A fine program for each session had been arranged, with all visitors attending the Minnesota-Iowa football game.

The Aberdeen District Medical Society held their monthly meeting and presented an enjoyable program as follows: Dr. C. N. Nixon of the Mayo Clinic, Rochester, addressed the assembly on "Goiter"; while the "Coronary Problem" was discussed by Dr. J. O. Arnson, Bismarck. Dr. R. G. Mayer, Aberdeen, presented "Case Reports—'Heamaturia,'" with remarks by Dr. E. W. Jones, Mitchell, president of the South Dakota Medical society. Dr. J. O. F. Kraushaar, Aberdeen, is president of the society and Dr. John Calene, secretary.

The Minnesota supreme court held illegal a contract entered into by John Granger, Minneapolis, with a pathologist, to furnish a health service to subscribers. Granger brought an action against the state board of medical examiners attempting to prevent them from interfering with his business. The Hennepin court sustained a

demurrer by the board, which decision is upheld in an opinion by Associate Justice Charles Loring Granger, who is not a licensed practitioner was charged with engaging in the practice of medicine through charge of an annual \$10 fee to subscribers for examinations.

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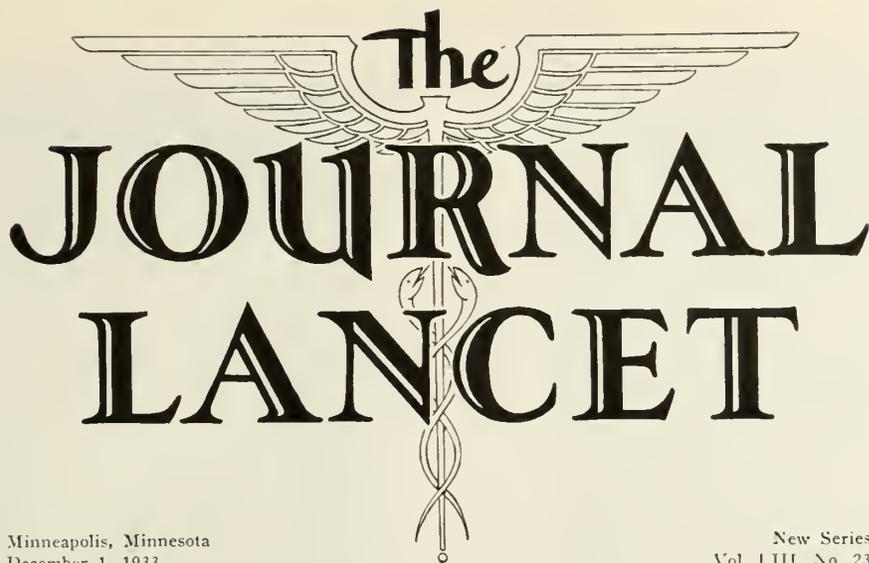
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Thyroid Disease in Children*

Arnold Jackson, M.D.
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Madison, Wis.

THYROID disease in children is one of the most important yet generally neglected problems confronting the medical profession. Few physicians realize the importance of educating parents to appreciate the seriousness of this menace. Rather than leave this problem entirely to health authorities and school boards, every physician should become interested in the prevention of goiter.

That the incidence of goiter in this country is on the increase in spite of localized efforts to check it, cannot be doubted. Estimates have been made that at least 25,000,000 persons are afflicted with thyroid disease, a considerable number of whom are children. Certainly more people are affected by thyroid disease than are suffering from the three great plagues, tuberculosis, cancer and syphilis.

Perhaps goiter does not arouse as much apprehension and concern as do these scourges because its immediate effects are not as apparent. The number of persons, however, having heart disease, hypertension, cretinism and mental inferiority as an end result of thyroid disturbance constitutes an ever increasing challenge to medical science. In order to successfully combat the spread of goiter in this country there must be an extensive educational campaign such as has been carried on against tuberculosis and cancer during the past decade.

*Especially written for the Goitre Number of THE JOURNAL-LANCET.

Obviously to make such a campaign successful, the people must be taught that it is their duty to prevent the development of goiter in their children, and that a failure to do so may result in serious consequences later in life.

The problem of the national prevention of goiter is complicated for the following reasons: No one has been able to estimate the exact limits of the goiter belt in this country. Statistics furnished by the war department as a result of draft examinations are of little value, since they concerned only adult males, and were frequently made by physicians not especially familiar with thyroid disease.

Exactly what constitutes a goiter is still another problem. One physician might examine a group of children and decide that eighty per cent of them were afflicted with goiter. In the opinion of his colleague perhaps only fifty per cent would show trouble. In other words when a thyroid gland is normal in size and when a colloid goiter has developed is a question at times that probably no one is capable of deciding. Consequently when we read that a statistical survey from some state showed a certain incidence of goiter we must bear in mind the old adage that statistics may be even made to tell the truth at times. Moreover it should be remembered that the incidence of goiter varies greatly within an area of a few miles.

When the child's neck assumes a convex rather

than a concave appearance, when a definite enlargement of the lobes may be palpated between the index finger and thumb, or when the presence of an adenoma may be felt, goiter may be assumed to be present.

In the light of our present knowledge a goiter belt extends across the country from Boston to Seattle and from the Canadian border to roughly speaking the Mason-Dixon line. Certainly anywhere within this territory goiter may be found, and consequently prevention should be carried on. South of this area also, goiter is found in considerable numbers in certain localities, but it does not appear to be endemic nor to constitute as serious an economic, social and medical problem. A consistent shifting population is bound to be a factor in changing this distribution.

ETIOLOGY

Our national problem of prevention is further complicated by the fact that there is no general agreement on the etiology of goiter. Opinion is about evenly divided between the iodine deficiency



Figure I. Typical Colloid adolescent goiter as seen in 80 per cent of the girls in this locality.



Figure II. Same child two years after treatment with Iodostarine and Thyroid.

and the germ theory. Chatin first propounded the former idea in 1850 and many other since, notably Marine, have tended to support this view. McCarrison, on the other hand, the foremost advocate of the germ theory has an equally large number of supporters. Perhaps the wisest plan is to assume that both theories are important and that iodine is essential to act as a germicide. The studies of Marine, Kimball and others would seem to prove that goiter may be prevented or even successfully treated by iodine if used sufficiently early. In my efforts to corroborate these conclusions, I have just concluded a ten year study on a group of one thousand children that I have treated with the idea of preventing goiter. This test has been carried on in a locality where the incidence of goiter is probably as high as any place in the United States. At the age of 18, over 80 per cent of the girls show evidence of thyroid enlargement and approximately 20 per cent of the boys. From this study, the only one that I know of in which the same group of

children has been followed for a decade, the following conclusions may be drawn:

If iodine medication is started sufficiently early it is possible not only to prevent the development of colloid but also of adenomatous goiter.

A colloid goiter when well developed seldom responds permanently to treatment either with thyroid or iodine medication.

The majority if not all adenomata develop before maturity and consequently except during pregnancy iodine therapy is not indicated as a prophylaxis in adults.

No amount of iodine or thyroid will eradicate the smallest adenoma.

Iodine should be administered during pregnancy to lessen the demand on the mother's thyroid as well as supply the needs of the child.

In this group of a thousand children, many of whom it has been possible to examine at regular intervals throughout the year from the age of puberty to maturity, it is of importance to know that not a single adenomatous goiter has developed when medication was instituted sufficiently early. On the other hand thyroid and iodine



Figure III. Case of Exophthalmic Goiter in a boy nine years of age. B. M. R. +33 per cent. All the typical signs and symptoms present.



Figure IV. Same boy two weeks following a one stage thyroidectomy. B. M. R. +5 per cent. Condition normal.

medication has had little effect on the majority of well developed colloid goiters. These findings are in contrast to those observed by Marine and Kimball who reported almost a complete disappearance of the signs of goiter after a three year study on groups of school children. My observations are all based on personal examinations that have been made with a steel tape measure and recorded in centimeters over a period of ten years.

Iodine and thyroid place the thyroid gland at rest in the presence of a colloid goiter and prevent the development of the second stage or adenomatous goiter. The theory that the latter develops as a form of compensatory hypertrophy in the presence of a neglected colloid goiter appears to be correct.

PREVENTION

In an effort to ascertain the most satisfactory method of preventing or treating colloid goiter, over thirty preparations of iodine and a dozen varieties of thyroid have been used. The end results are difficult to evaluate but they appear to be about the same no matter what preparation is used. As a result the desires of the child should perhaps be given first consideration and a

small tablet combined with chocolate that is palatable and effective is preferable. In my own experience I have found the tablet used by the Swiss, known as iodostarine, to be the most satisfactory. Each of these tablets contains ten milligrams of iodine and one a week is prescribed from the age of four until ten; two between ten and fifteen; and three from fifteen to twenty-one. While this amount of iodine is in excess of stated theoretical demands of the thyroid gland, clinical experience in this series of cases has shown this dosage to be indicated. Further to be effective I believe iodine should be administered at regular weekly intervals throughout the school year, and not merely given over a brief period in the fall. Analysis of the iodine content of the blood has shown the curve to reach a peak in August and a low point in February and March. With the iodine content of the blood lowest in the spring after a cold sunless winter there is every indication for increasing rather than decreasing iodine therapy. Modern methods of transporting green vegetables in the winter time from the sunny south may prove a helpful factor in making available more iodine.

In this group, thyroid grains one or two, depending upon the age, has been administered daily for one or occasionally two months during the year. The most favorable results have been obtained by Armour's and the Parke-Davis desiccated preparations. No noticeable improvement was noted in a two-year study of the emplet form.

The factor of heredity is certain a definite one that must be considered along with the iodine and germ theories in relation to etiology. In many instances in this group one or more descendants of goiterous parents had large colloid



Figure V. Typical cretin child three years of age unable to speak or walk. Delayed dentition.



Figure VI. Same child two years later after thyroid and pituitary medication. Child now in school and speaks well.

or adenomatous goiters. The question of prophylaxis then is even more important if one or both parents has a goiter. Preventive treatment should be instituted as soon as the child is able to cooperate, which is usually at the age of three or four.

One question that is frequently asked concerns the wholesale distribution of iodine through the various mediums of water, salt, and so forth. The prophylactic use of iodized water has proved economically unsound, if for no other reason. I have never seen iodized salt do harm to a child; I am not sure the same can be said for adults. Cases of iodine hyperthyroidism induced in adenomatous goiters by the use of iodized salt have been reported by several European and by a few American writers. If we believe that adenomatous goiters have their inception before the age of maturity I can see no reason for every grocer and druggist dispensing an unknown amount of iodine to our adult population. While there may be no facts to prove that the indiscriminate distribution of iodine causes harm, neither are there any to prove that it does good to our adult population. From my clinical experience I would say that the amount of iodine the average child receives by the use of salt is insufficient to be effective, yet in the absence of more effective methods of prevention this is certainly to be preferred to none. McClure has attempted to show that iodized salt has been a factor in reducing the incidence of toxic goiter in Michigan, because the number of thyroidectomies at the various

Detroit hospitals has been reduced in recent years. Very little iodized salt is used in Wisconsin and Minnesota, and the number of thyroidec-tomies has been considerably curtailed in these states also. The depression and a general improvement in health with fewer epidemics, such as influenza, seem to me to be more vital factors.

CLASSIFICATION

The classification of thyroid disease in children is essentially the same as that described in adults by Plummer, with the one exception of toxic adenomata, which if it does occur is extremely rare. These diseases might be listed as follows:

1. Colloid goiter
2. Adenomatous goiter
 - a. Iodine Hypertthyroidism.
3. Exophthalmic goiter
4. Cretinism
5. Myxedema and Hypothyroidism.
6. Thyroiditis
7. Tuberculosis, Syphilis, Malignancy, etc.

EXOPHTHALMIC GOITER

Exophthalmic goiter in children, while it does occur, might be spoken of as an unusual disease of childhood, an infinitesimal percentage considering the population as a whole. In the group of children I have had under observation there have been 21 cases, the youngest being six years of age and the oldest seventeen. From a study of these and other cases, the following conclusions may be drawn. The symptoms are essentially the same as in the adult. The child is usually nervous, restless, shows exophthalmos in about eight per

cent of the cases, has an increased pulse rate and thyroid enlargement and usually a tremor. About half the cases lose weight in spite of an increased appetite, and complain of shortness of breath on exertion. Diarrhea and vomiting occurred in only twenty-three per cent of this group. Weakness of the quadriceps group of muscles was present in half the cases.

The successful treatment of these cases, depends upon early surgical intervention just as it does in adults. In only one case was a medical régime successfully tried. All the children with one exception were successfully operated upon, and in only one instance was it necessary to use a general anesthetic. The risk of surgery is naturally increased in a child, as it is with any major surgical procedure, because it may not always be possible to obtain the co-operation one can with an adult. The only death in this series was that of a sixteen year old girl who had received iodine medication for six months before coming to the clinic, and who had become iodine fast. The patient developed a typical crisis a few hours after operation, in spite of all measures to the contrary.

CRETINISM

It has generally been believed that cretinism was not endemic in the United States, and likewise it has been held that different types of goiter existed in various parts of the world. From material I have gathered from many countries, I believe adenomatous goiter occurs in almost every inhabited country, although it is true the toxic form is perhaps more prevalent in this country. Cretinism is increasing rapidly in the United States, and is, I believe, now endemic in certain areas. Stoddard recently collected a series of sixty-eight cases in Wisconsin, of which I was able to supply the data on fifteen. Some of the cases are the typical European form, and even show deaf-mutism and imbecility. A few of the patients have responded brilliantly to thyroid therapy; the majority show no response. For the treatment to be very successful the diagnosis must be established before three years of age.

Children with hypothyroidism and the so-called infantile myxedema show a marked improvement under glandular therapy.

Thyroiditis is uncommon in adults and rare in childhood. Occasionally the acute suppurative form may occur with no apparent etiological factor, and as in the adult, should be treated by incision and drainage. I have never observed the chronic form, nor the tubercular type in children.

(Continued on Page 641)



Figure VII. Acute Purulent Thyroiditis in a child. Condition cured by incision and drainage.

The Life History of Bosselated Goiters*

Arthur E. Hertzler, M.D.
Halstead, Kan.

THERE is an astonishing divergence of views on the clinical significance of bosselated goiters. A book recently published expresses the belief that nodular goiters are innocent. The indications for operation the author places at deformity and pressure. To me bosselated goiters are as relentless in their course as cancer. The failure to recognize this fact is because too few practitioners are privileged to follow these patients through the series of years which is necessary to appreciate their life history when uninfluenced by treatment. When the terminal stages only are observed, death is usually ascribed to some form of heart disease without due appreciation of the role the goiter played in causing the failing heart.

It has been my privilege to follow many of these patients from simple goiter to death from cardiac decompensation. All the bosselated goiters I have followed for many years died of the same sort of heart condition, save those who died of intercurrent diseases. On the contrary, those who were relieved of their goiters by operation did not become so afflicted with cardiac complications.

My theme, in view of this experience, is that bosselated goiter is a serious disease and will ultimately kill the patient unless removed by operation.

Pathogenesis—By bosselated goiter is generally understood those which have developed nodules which are palpable on physical examination. This view is too narrow. Very many goiters which present a perfectly uniform surface show circumscribed tumors when they are cut across. The structure and the clinical significance of the two groups are the same.

If one examines many goiters representing all ages from adolescence to old age, one sees that the transition is a gradual one. In the young the cut surface is uniform, but the field is divided into compartments by fibrous septa. In the course of time some of these compartments become distended while others become compressed. The result is that many spherical nodules come to compose the goiter.

In the course of years these nodules undergo a series of degenerations and partial replacement by cysts and fibrous tissue. The anatomic details of these changes are of no importance here. The fact that they uniformly occur suffices for our purpose here.

Symptomatology—Since disturbance of respiration is so commonly regarded as the chief indication for operation, this symptom requires special consideration.

As the goiter grows, pressure may be caused on surrounding organs, producing a sense of discomfort, generally a disturbance of respiration. When a disturbance of respiration is complained of it may be due to a nervousness giving a general sense of apprehension augmented by the consciousness of the presence of a lump in the neck. In addition to nervousness the respiratory trouble may be due to a failing heart, or to direct pressure of the goiter on the trachea. Each of these causes must be analyzed.

Nervous dyspnea is apt to be most marked at night soon after retiring or when excited, near the menstrual time, during pregnancy, and at the approach of the menopause. It is relieved by sedatives without any change in the habits of the patient. The heart and respiratory sounds are normal.

Dyspnea due to impending heart failure is most pronounced after a hard day's physical exercise. As it becomes more pronounced, strenuous exercises become at once the source of acute dyspnea. This type is the least common and is apt to be associated with evidence of dropsy elsewhere. Early the apex is somewhat displaced and the heart sounds sharp. Later the apex becomes heaving and the sounds more booming. Then follows soon the irregularity in rate and volume. This, together with the presence of a goiter, should awaken the most lethargic doctor.

When dyspnea is due to pressure from the goiter it is capable of demonstration. The dyspnea may be increased by certain conditions as in elevating or depressing the chin or in lying on one side or the other. In these cases the X-ray will show the trachea dis-

*Especially written for the Goiter Number of THE JOURNAL-LANCET.

placed or flattened, or both. A calcified nodule may cause narrowing of the lumen. The X-ray shows the exact site of compression by a calcified nodule. A substernal goiter may cause deviation or compression of the trachea. This also is demonstrable by the X-ray.

Loss of weight, sleeplessness, tremor, nervousness, rapid heart and a number of other symptoms may be observed in bosselated goiters. These are the expression of epithelial hyperplasia, a basedowified colloid, and are not a part of the picture which makes of the colloid goiter a dangerous disease through cardiac failure. These secondary toxic goiters belong to a different group and should not be confused with those which destroy by causing cardiac damage.

The bosselated goiters differ from the toxic goiter in that the pulse is slow, before the advent of decompensation, the loss of weight is no more common than an increase and the basal metabolic rate is usually subnormal. There is less commonly a history of exacerbations and remissions. The progress is commonly as silent as it is insidious and relentless.

Prognosis—Most of the deaths of patients who die of goiter in a hospital are due to heart failure. The heart refuses to slow down and become regular under rest and medication. The patients develop hypostatic pneumonia, they become emaciated or they become delirious and die in a state of extreme hyperpyrexia. Some just fade out without any particular augmentation of any of the symptoms. They never reach a state when operation, even partial, is reasonably safe. Some clinics have no deaths following operation on these cases. We are not so fortunate. If die they must, we prefer that they do it at their leisure.

Treatment—The general rule in operating goiter is to leave a certain amount of the gland. This is, of course, inevitable in those who operate only for cosmetic reasons or to relieve pressure on the trachea. Other operators keep in sight the amount they remove, not what they leave. They take a big hunk off the top and call it a day. All this is operating on the goiter rather than on the disease that threatens the patient.

The bosselations are all of one breed and if we are to secure immunity from later heart complications for our patients we must re-

move all the bosselations, no matter where located or what is left after the operation is finished. No matter how much is left. If there is a nodule it must come out. If the patient becomes temporarily or permanently myxedemic, fine. It is proof that the operator has done a good job. She will not die of a goiter heart and a grain a day of thyroid extract for the rest of her life is no great task. As a matter of fact, even with such radical operating myxedema, even temporary, is rare.

Such operating requires a careful technic. It cannot be done by blunt dissection. The gland must be completely dislocated so that the trachea is exposed full length on both sides. Less thorough operating will overlook nodules which have found themselves a place in adjacent tissue.

CONCLUSION

Bosselated goiter is a dangerous disease and will kill the patient sometime unless surgically removed. The removal of all the affected portion of the gland is imperative.

THYROID DISEASE IN CHILDREN

(Continued from Page 639)

There have been a few reports of congenital luetic thyroiditis in the literature.

Malignancy in the young is likewise a rare lesion, although Catell recently reported a case at the Lahey Clinic of a small cell carcinoma in a boy of thirteen, who died thirteen months after operation. The youngest case of malignancy of the thyroid which I have observed was in a boy twenty years of age.

It has long been recognized that when one of the internal glands becomes deranged the function of the others might become disturbed. This is particularly true in exophthalmic goiter in children when the pituitary gland is involved also, and children may attain a height of well over six feet.

In conclusion it may be said that the biggest problem concerning those interested in the subject of goiter in this country today is that of prevention in children. Not only is it important for the present generation, but it is concerned with such significant factors as cretinism, heart disease, hypertension, lowered mentality and deaf-mutism as to be doubly important to the future generations.

The Development of Exophthalmic Goiter Fifteen Years After Operation for Carcinoma of the Thyroid Gland*

John deJ. Pemberton, M.D.†
Rochester, Minn.

Richard J. Bennett, M.D.‡
Edmonton, Canada

THE ASSOCIATION of carcinoma of the thyroid gland and exophthalmic goiter is rare. Although carcinoma may occasionally arise from the hypertrophic gland of exophthalmic goiter, search of the medical literature reveals no reference to the interesting sequence of events encountered when exophthalmic goiter develops subsequent to subtotal thyroidectomy for carcinoma of the thyroid gland. An illustrative case is here reported.

REPORT OF CASE

A woman, aged thirty years, registered at The Mayo Clinic, December 5, 1918, because of a goiter of ten years' duration, which had definitely increased in size during the preceding year. She complained of an uncomfortable feeling in the neck, and of some pain at times.

The patient's normal weight was 140 pounds (63 kg.) but at the time of examination she weighed 128 pounds (57 kg.). The blood pressure in millimeters of mercury was 112 systolic and 72 diastolic, and the pulse rate was 80 beats each minute. Urinalysis revealed the presence of albumin, graded 2. The concentration of hemoglobin was 78 per cent, and leukocytes numbered 6,000 in each cubic millimeter of blood. A roentgenogram of the thorax revealed marked calcareous deposits in the right part of the mediastinum and at the hilus of the right lung. The basal metabolic rate was not recorded. There were multiple nodular tumors of the thyroid gland.

At operation, December 11, 1918, the thyroid gland was found to be about four times its normal size, and contained multiple adenomatous nodules. In addition, there was in the left lobe a carcinomatous nodule about 4 cm. in diameter. Subtotal thyroidectomy was performed; both lobes were resected and the isthmus was removed; on the left side glandular tissue equivalent to about one-fourth of a

lobe of normal size, and on the right side only tags of tissue, were preserved. The pathologist reported adenocarcinoma, 3 cm. in diameter, graded 2, in a colloid and fetal adenoma (Figure 1) of the left lobe. The right lobe revealed multiple hemorrhagic, fibrous, degenerating, colloid and fetal adenomas (Figures 2 and 3). While at the clinic, the patient received three radium treatments, amounting to 8,650 mg. hours, and she was advised to continue receiving treatment with radium on her return home.

May 17, 1933, the patient again registered at the clinic with the complaint of enlargement of the left lobe of the thyroid gland, which had been noted during the preceding ten months, and pain and stiffness, which had been present in both knees for the last five weeks. She stated that since the thyroidectomy in 1918 she had been well, until June, 1932, when she had experienced an occasional aching sensation in the left side of her neck, and had become a little nervous. A month later there had been visible swelling of the left lobe of the thyroid gland, and in December, 1932, the patient had become slightly hoarse and had had slight difficulty in swallowing. At this time a cutaneous lesion had developed on both arms, shoulders, legs and feet, which had been diagnosed, elsewhere, as trichophytosis. In February, 1933, she had been given trichophytin vaccine twice weekly, with good effect on the cutaneous lesion. She had lost 20 pounds (9 kg.) in the preceding six months.

Examination revealed that the patient was well nourished, was stimulated to grade 2, presented weakness of the quadriceps muscles, grade 1, and tremor of the fingers. The left lobe of the thyroid gland was enlarged, presenting an unusually firm, partially fixed and slightly nodular mass, about two to three times that of a lobe of normal size. On the right side of the trachea, felt on deep palpation, was a small, firm nodule about 1 cm. in diameter, which moved on deglutition. The

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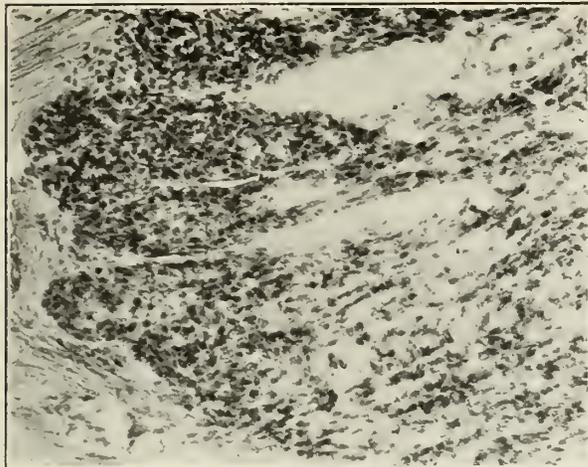


Figure 1. Adenocarcinoma of left lobe, 1918.

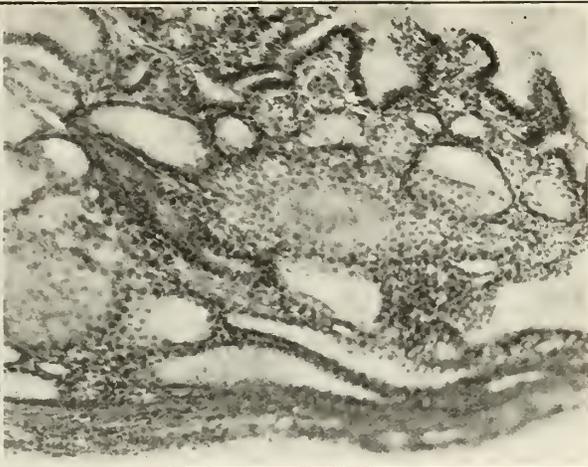


Figure 2. Adenoma of right lobe, 1918.

blood pressure in millimeters of mercury was 130 systolic, and 76 diastolic; the pulse rate was 96 beats each minute. The basal metabolic rate was +43 per cent. Examination of the larynx showed that the vocal cords moved normally. The diagnosis of exophthalmic goiter was made, although recurrent carcinoma of the thyroid gland could not definitely be excluded.

After preparation with compound solution of iodine (Lugol's solution) operation was performed June 5, 1933. After dense adhesions had been separated, the left lobe of the thyroid gland was exposed and was found to be about two to three times larger than a normal lobe, and grossly presented the appearance of the hypertrophic gland of exophthalmic goiter containing adenomas. The left lobe was resected and the posteromesial portion of the lobe, equivalent to about a fourth of a lobe of

normal-size, was preserved. The left inferior thyroid artery was ligated at a point proximal to its entrance into the gland. The pathologist reported a fibrous, nodular, hypertrophic, parenchymatous colloid thyroid gland with two fetal and colloid adenomas (each 1 cm. in diameter) one of which was undergoing cystic degeneration (Figure 4).

The patient's convalescence was uneventful save for the fact that her wound was slow in healing. On June 27, 1933, her basal metabolic rate was +2 per cent.

COMMENT

The case is unique in that fifteen years after subtotal thyroidectomy for carcinoma, exophthalmic goiter developed as a result of hypertrophy of the remnant of the thyroid tissue. In addition, the case presents two other interesting features which warrant comment: the

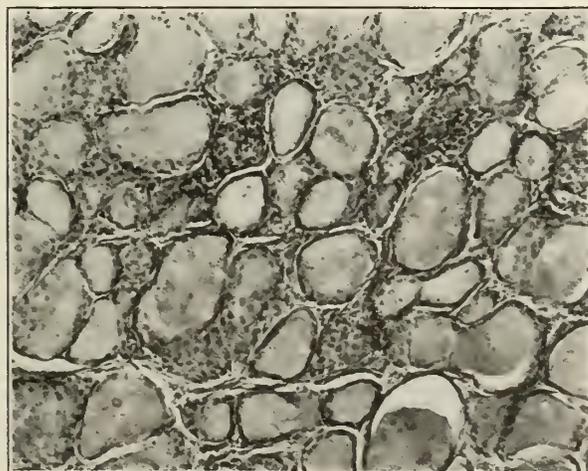


Figure 3. Another section of adenoma of right lobe, 1918.

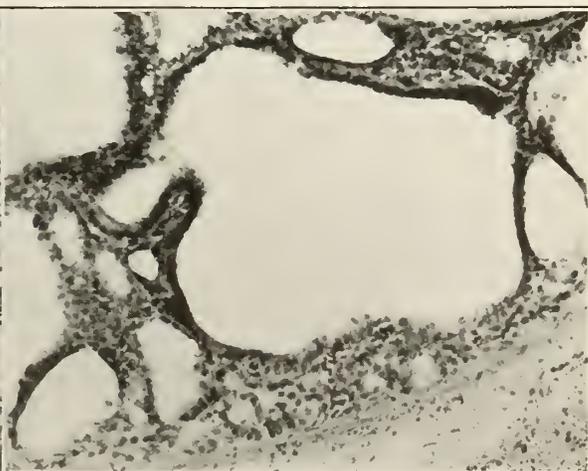


Figure 4. Hypertrophic parenchymatous colloid thyroid.

difficulty of diagnosis and the curability of carcinoma of the thyroid gland. The definite history of the presence of carcinoma in the thyroid tissue that had been resected about fifteen years previously, and the subsequent enlargement of the remaining portion of the gland, producing an unusually firm, partially fixed mass, with surface irregularity, combined to make plausible the diagnosis of recurrent carcinoma of the thyroid gland. However, the presence of definite evidence of hyperthyroidism (basal metabolic rate $+43$ per cent) of exophthalmic goiter type was strongly suggestive evidence that the enlargement of the thyroid gland was benign in character. Because not infrequently the remaining portions of the glands of patients who have undergone partial thyroidectomy for exophthalmic goiter will grow exuberantly and present firm, partially fixed, irregular masses in the neck, the condition may be diagnosed malignancy of the thyroid gland. Broders has called attention to the fact that the pathologist may even fall into the same error, and may confirm the clinical diagnosis of carcinoma by mistaking regenerative hyperplasia for malignancy. The question of whether thyroid carcinoma functions as thyroid gland is probably not settled, but certainly there is no evidence to indicate that it is capable of functioning to the extent of producing hyperthyroidism. Although hyperthyroidism may be associated with carcinoma of the thyroid gland, it is probable that the hyperthyroidism is always an associated feature, rather than the product of the malignancy. In a previous analysis of eighty-seven cases of malignant tumor of the thyroid gland in which basal metabolic rates were recorded, one of us² found that in 61 per cent the rates were within normal range,

in 26 per cent they were elevated, and in 3 per cent they were subnormal. Since malignant tumors of the thyroid gland do not produce a constant effect on basal metabolism and since such a high percentage (87 per cent) of patients with carcinoma of the thyroid gland have co-existing benign tumors, the conclusion seemed logical that these variations in basal metabolism are influenced more by the benign than by the malignant tumor. When enlargement of the thyroid gland, other than adenomatous enlargement, is associated with hyperthyroidism, it is our belief that malignancy can be reasonably excluded in the differential diagnosis.

The case also illustrates the curability of carcinoma of the thyroid gland. In this respect the case is not unique. In a recent review³ of the records of 323 patients with carcinoma of the thyroid gland who were operated on in The Mayo Clinic before July 1, 1928, it was learned that 137 patients (43.9 per cent) have lived five years or longer, and sixty-four, or nearly 20 per cent, have lived more than ten years. These results not only refute the belief of the hopeless prognosis in cases of carcinoma of the thyroid gland that are held by the public and, to some extent, by members of the medical profession, but they prove that under combined surgical treatment and irradiation the prognosis of carcinoma of the thyroid gland is as favorable as that of any organ, excluding that of the skin and lip.

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The Preservation of the Parathyroids During Thyroidectomy*

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A SUCCESSFUL thyroidectomy consists of the removal of the proper amount of thyroid tissue and the avoidance of complications. Among the more serious complications incident to this operation is parathyroid insufficiency, either due to the injury or removal of the parathyroids. It has been conclusively demonstrated that thyroidectomy can be done, if proper technical steps are carried out, without the distressing complication of tetany. The means of preserving the parathyroids during thyroidectomy as performed at the Lahey Clinic will be presented in this discussion.

It is of primary importance to know the surgical anatomy of the parathyroids in carrying out thyroid operations. In the standard text books of anatomy for parathyroids are shown typically to be four in number, the superior pair being found on the posterior surface of the superior pole, while the inferior pair are shown on the lateral surface of the inferior pole. (Fig. I). While these are the usual positions in which they are found, wide variations occur in the position at which they are encountered during a thyroidectomy. In 1925 we called attention to this variation in position,

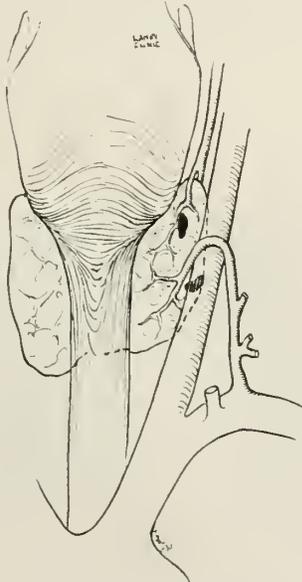


Figure I. The diagram of the posterior view of the pharynx and thyroid which shows the position of the superior and inferior parathyroids as presented in standard texts.

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a fact which must be recognized if the parathyroids are to be preserved. In a careful examination of both thyroid lobes during operation and a careful examination of the resected portions of gland, we demonstrated parathyroids in every position on the surface of the gland as well as a rare instance of a parathyroid buried in the substance of the thyroid. The number of parathyroid glands in man can be considered to be constantly four. However, there are conspicuous variations in size, shape, color and position. They may vary in size from three millimeters, in their largest dimension, up to nine or ten millimeters. At times they are round in contour or may be pulled out in long narrow strands. The more typical shape is a flattened, pear-like contour. Characteristically they are yellowish brown in color, but this depends upon the amount of fat and epithelial elements which are present. They may be almost identical in appearance to the thyroid or a grayish red resembling the appearance of lymph nodes. It is quite important in their correct identification to be able to show that they are discrete, that they have a definite outline, that they are movable in relation to the thyroid, and that they are enclosed in a separate layer of connective tissue. Each parathyroid can be shown to have a separate blood supply and they usually are found to be in intimate relation to branches of either the superior or inferior thyroid arteries. While the most frequent position at which they are encountered at operation is the postero-lateral surface of the inferior pole, we have found them along the anterior division of the superior thyroid artery, on the anterior surface of the isthmus, below the inferior pole and on the anterior surface of the gland, named in order of frequency. (Fig. II).

Thyroidectomy as performed in this clinic is carried out with the widest possible exposure so as to give direct vision of all of the positions where parathyroids may be encountered during the resection. The usual, slightly curved skin incision is made a short distance above the line of the clavicles and the skin flap is raised leaving the platysma on the flap. The flap is dissected upward as high as the upper border of the thyroid cartilage exposing the anterior half of the sternomastoid muscle on each side. The lower

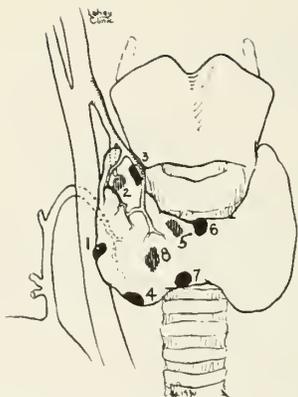


Figure II. A diagram of the anterior surface of the thyroid showing the various positions and frequency in which parathyroids are found during thyroidectomy. The shaded parathyroids are on the under surface.

portion is not freed. After lateral retraction of the sternomastoids both the sternohyoid and sternothyroid muscles are divided transversely high in the incision. This gives an excellent exposure of all of the anterior surface of the gland. The superior pole is then grasped and pulled downward after freeing and retracting the internal jugular vein and common carotid artery. Careful examination is made of both the anterior and lateral surface of the superior pole for possible parathyroids. If one is encountered on the anterior surface of the superior pole the parathyroid is dissected from the gland, leaving its blood supply intact, and pushed upward. The superior thyroid vessels are then ligated above their entrance to the gland permitting the complete delivery of the superior pole. With the surgeon standing on the side of the lobe that is to be resected the lobe is pulled forward and medially, dividing the middle thyroid vein or veins and completely freeing the lateral surface from its loose connection with the internal jugular vein and carotid artery. This permits direct vision of the entire posterolateral aspect of the gland. A parathyroid is frequently encountered beneath the middle thyroid vein on the surface of the gland or in the loose areolar tissue immediately below it. (Fig. III). After a careful inspection of all of the exposed surfaces, resection of the first lobe and isthmus is carried out leaving behind a small strip of thyroid tissue posteriorly. The trachea is completely bared. With the surgeon changing to the other side, resection of the opposite lobe is then performed in a like manner. It will be noted that no special search for the parathyroids is made if they are not directly encountered in the area of resection. If they are found high up on the gland this area of thyroid is pushed down with the parathyroid

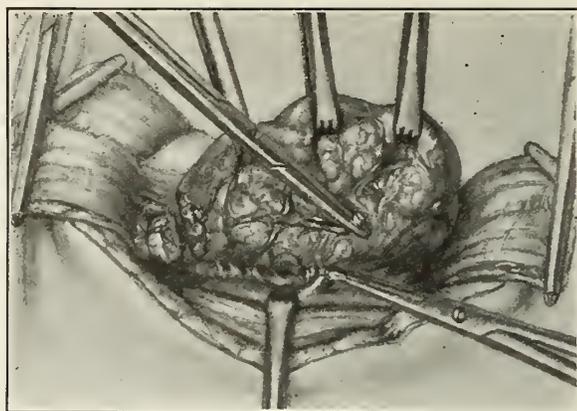


Figure III. Complete exposure of the right lobe of the thyroid after division of the superior pole and middle thyroid vein. A parathyroid is frequently seen under the middle thyroid vein.

intact and is left as part of the remnants. The operation is completed by folding over these small remnants toward the midline. If bleeding is encountered we do not hesitate to ligate the inferior thyroid artery at the point where it comes out from under the common carotid artery. Ligation at this position avoids injury both to the parathyroids and to the recurrent nerve. Ligation of all four thyroid arteries has not resulted in parathyroid insufficiency in our experience and seems unlikely to occur since there is an adequate collateral blood supply. It is not to be recommended, however, as a routine procedure.

Before the wound is closed each portion of resected gland is carefully examined for presence of any parathyroids that may have been inadvertently removed in spite of these technical precautions. (Figs. IV, V). Any parathyroid or suspicious nodule which is found on the resected specimen is transplanted at once into one of the sterno-

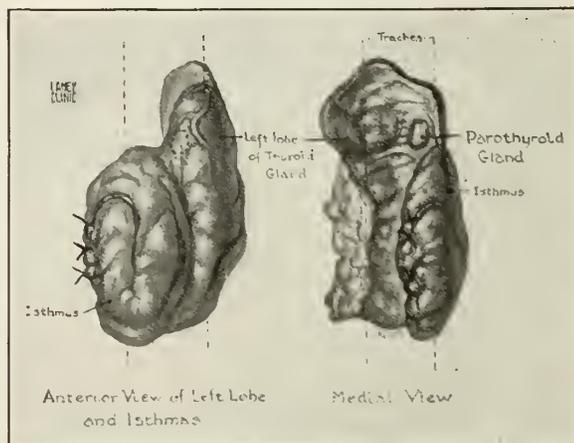


Figure IV. An operative specimen on which a parathyroid gland was found, in the typical position of the superior gland. This gland was transplanted at the time of operation.



Figure V. A parathyroid found in relation to the superior thyroid artery which was subsequently transplanted.

mastoids after a thin section has been removed for microscopic examination. (Fig. VI). From 1925 to 1929 transplantation of parathyroids or bodies suspected of being parathyroids was carried out during three hundred and forty operations. Each one was carefully examined microscopically and of the entire number thirty-four per cent were proven to be parathyroids. Since 1929 we have continued this practice so that at present we have transplanted over five hundred of these bodies. Not considering the value of such transplants in carrying out the function of parathyroids, this routine is very valuable to the surgeon in realizing the position in which these parathyroids are found and it enables better preservation of them in any position. Before 1929 in eight per cent of all thyroid operations transplantations were carried out. This number has decreased since that time since fewer parathyroids are now

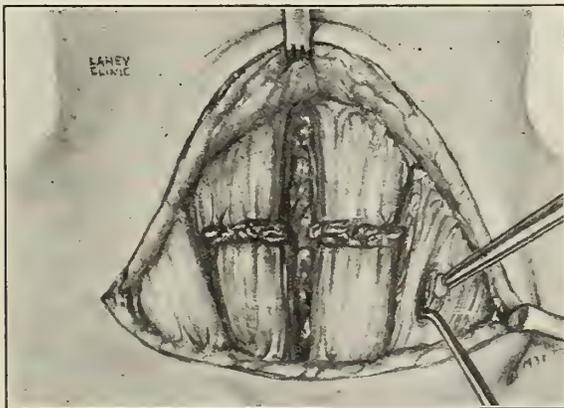


Figure VI. The method of transplantation of any parathyroids found on the resected gland is shown. The gland is placed within the fibers of the sternomastoid muscle.

removed. With this technique of thyroidectomy parathyroids are encountered in approximately twenty per cent of all subtotal thyroidectomies. It is obvious that if parathyroids are encountered during operation they can be adequately protected.

The final test of thyroidectomy in the preservation of parathyroids must be interpreted by the incidence of parathyroid tetany following thyroid operations. Parathyroid tetany is a rare complication in this clinic. Up to 1929, 6,682 thyroid operations were performed with tetany occurring in eleven patients, an incidence of 0.16 per cent. From 1929 to 1933, 5,418 operations were done and seven patients developed parathyroid tetany, an incidence of 0.13 per cent. Of the eleven patients in the first series, eight had transient symptoms which were completely relieved after a brief interval, following which no further symptoms were noted and the blood calcium was normal. Three of the number had chronic and persistent tetany. In the second series of seven patients with parathyroid tetany, five were transient while two have had persistent tetany and are at present under treatment. In the entire series of 12,100 thyroid operations, eighteen patients had tetany, thirteen of which were temporary while five continued to have serious trouble. Two have subsequently died directly as a result of the tetany while three are still receiving therapy.

While it is probable that transient tetany is due to direct trauma or interference with the blood supply of the parathyroids it seems most likely that chronic and persistent tetany is due to removal of two or more of them. In experimental animals one parathyroid usually is sufficient to maintain a satisfactory function. Tetany has followed hemithyroidectomy when the other lobe was not disturbed. Again, tetany has followed removal of a hyperfunctioning parathyroid adenoma where the other parathyroids were not disturbed. This offers an explanation for the occurrence of transient tetany following thyroidectomy since in the first instance a normal parathyroid function was diminished and in the second an increased function was lowered considerably below the level to which the patient had become accustomed. From experimental and clinical evidence it can be usually assumed in cases of parathyroid tetany following thyroidectomy that one or more of the parathyroids have been removed; it may at times occur following direct trauma, either incident to operation or possibly due to contracture of scar tissue, or interference with the blood supply.

(Continued on Page 649)

What to do With the Profoundly Undernourished Thyrotoxic Patient*

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IT IS NOT so very uncommon to find a thyrotoxic patient in a state of profound emaciation. Sometimes, it is not altogether due to insufficient food intake but to faulty absorption of food ingested. The patient burns some of his own material. At some other times it is due to marked vagotonic gastro-intestinal reactions such as vomiting, diarrhea, etc. In such instances the food is not partaken, because of loss of appetite, and if it is taken, it is at once expelled with the vomitus. Here, we have an actual shortage of food intake and of food absorption.

The first thing to do, of course, is a searching general diagnostic survey. This begins with a careful, minute history not only as to the behavior of the present ailment, but as to the past life history of the patient. This may not be so important if one deals with a frank case of hyperthyroidism to which the gastro-intestinal syndrome is clearly related. Here, the diagnosis and especially the etiological relationship between the two is obvious; the control of thyrotoxicosis will automatically take care of the gastro-intestinal syndrome.

But the matter is not such an easy one when it comes to handling the mixed and obscure forms in which the etiology of the trouble is not such an obvious one. Here, too, a systematic divisional examination of the various body systems, all the laboratory studies likely to throw some light on the problem, the basal metabolism, the neuro-psychiatric examination, the general behavior of all the endocrines must be looked into. Particular study must be made of the function of the gastro-intestinal tract. Then, all the information obtained from the history and from these multi-divisional diagnoses secured from the examination of the various body systems are pieced together. Out of all this synthetic procedure comes frequently a clearer conception of the trouble at the base of the emaciation observed, for which a rational treatment can then be instituted.

1st. *Emaciation Is Caused by a Frank Case of Hyperthyroidism.* The line of conduct be-

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comes simpler. The first thing to do is to direct our efforts against the thyroid by instituting the Lugol's treatment. Given by mouth, it may not be tolerated, hence, the indication to give iodine intravenously in the form of sodium iodide, Lugol's in salt solution subcutaneously, even rectally, if necessary, at first. The rectum, however, must be spared as much as possible for rectal feeding.

If the case is a subacute one, X-ray treatment of the thyroid is quite beneficial in quieting the thyroid overactivity.

If, however, the case is acute, especially if the gastro-intestinal symptoms are quite marked, if delirium is present, X-ray treatment of the gland or any other form of aggressive intervention is *absolutely contraindicated*, as it will serve only to exaggerate the syndrome and throw the patient into a superacute thyroid crisis.

Naturally, these cases are found to be profoundly dehydrated; the water balance is restored. Acidosis, too, is present; this also is taken care of by appropriate medication.

Hygienic measures, such as hydrotherapy, quiet, fresh air, and sunshine help along. So does appropriate sedative medication.

In the past ten years we have been using *insulin* routinely in such cases, and have found it quite beneficial to our patients, despite the fact that insulin increases the gastro-intestinal motility. Indeed, in such cases as the ones we discuss, it would seem that the object is to quiet down an already too active gastro-intestinal system instead of activating it more. Nevertheless, these patients do well with insulin. Perhaps it is due to some influence on the gastro-intestinal secretion. We know that it augments the biliary and pancreatic secretions.

As soon as the patient is in condition to have a thyroidectomy this ought to be done by all means.

The Cause of Emaciation Is Not Obvious. It is in this class that the searching history, and the minute general survey of the patient, as said before, is of great assistance.

If the underlying cause is the thyroid, then our efforts are directed against it. If other

somatic effects appear to be responsible for it, active measures must be taken against them. A complete gastro-intestinal survey, functional as well as skiagraphic, must be made, and one must act according to the dictates of the findings.

When all that is done, medical measures must be systematically undertaken. An appropriate diet, containing the necessary proportions of protein, carbohydrates, fats, vitamins, mineral salts, roughage, and water must be found. General hygienic measures, such as mental and physical rest, fresh air and sunshine, hydrotherapy, etc., are resorted to. Special effort is made to stimulate the digestive capacity of the gastro-intestinal tract. If hyperacidity is present, it is counterbalanced by alkalines. If anacidity is present, hydrochloric acid is given.

Finally, *insulin* is a great adjuvant, as it not only improves the physiological function of the stomach, intestines, liver and pancreas, but it also enables the body cells to metabolize larger amounts of carbohydrates, proteins, fats and water.

This insulin treatment is carried out as long as it is necessary until the patient has gained weight.

Before undertaking the insulin treatment it is well to determine the glucose tolerance of the patient in view of the possible hypoglycemic tendencies that patient may naturally have.

PRESERVATION OF PARATHYROIDS DURING THYROIDECTOMY

(Continued from Page 647)

The symptoms of post-operative tetany are so characteristic that the diagnosis can be readily made. In any doubtful case, the blood calcium determination is of great value. The clinical manifestations of tetany are rarely evident if the blood calcium is above 7.5 milligrams. In severe tetany the calcium value may fall to as low as 3-5 milligrams.

In the mild and transient cases the symptoms may disappear without therapy. In the severe acute form occurring thirty-six to seventy-two hours after operation active therapy must be given. A high calcium intake is essential. This is given in the form of calcium gluconate or calcium chloride intravenously and large amounts of calcium lactate orally. Parathormone is given in one to five cubic centimeter doses subcutaneously or intramuscularly. The response to these measures is somewhat slow but the spasms will usually disappear in thirty minutes to two hours. In the transient cases no further symptoms occur after seven to ten days and the blood calcium is changed to a normal level in a somewhat longer period. In chronic cases we continue the high calcium diet and give calcium lactate in amounts up to the point of causing digestive disturbance. In addition we give viosterol, three to nine minims daily. Parathormone is usually used only with the onset of actual spasms.

We have transplanted three parathyroids from other patients to three patients with tetany without permanent improvement. In one other patient we transplanted a hyperfunctioning parathyroid adenoma and obtained temporary but not lasting benefit. Transplantation of parathyroid removed during operation into the same patient offer a definite possibility in the prevention of tetany but transplantation from one patient to another seems of no value.

Every patient with chronic parathyroid tetany should be under the observation of an ophthalmologist. In most cases lens opacities can be demonstrated after six to nine months and there may be gradual diminution in vision due to the development of bilateral cataracts. These cataracts can be removed after two or three years and satisfactory vision procured.

SUMMARY

Parathyroid tetany should be considered a preventable complication of thyroidectomy, if an adequate exposure of the area in which parathyroids are commonly encountered is obtained. In 12,100 operations performed at the Lahey Clinic tetany occurred in 18 patients (0.15%).



Prevention of Complications in Thyroid Surgery*

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STANDARDIZED methods of treatment have resulted in a uniformly low mortality rate following operations on the thyroid. A satisfactory technic, and there are many, is one which can be carried out in a reasonable length of time under the influence of some light anesthesia or analgesia augmented by local anesthetics and the removal of the proper amount of gland without injury to the recurrent laryngeal nerve and parathyroid bodies and which gives a satisfactory cosmetic and therapeutic result. While mastery of some accepted technic is essential, it certainly behooves each thyroid surgeon to use his clinical judgment and surgical skill in preventing post-operative complications and thereby reducing the morbidity rate to a minimum. Complications often indicate an error in judgment. The surgeon has failed to make the proper appraisal of the severity of hyperthyroidism; he has under-estimated the recuperative powers of the patient; he has failed to note the extent of the degenerative changes in the vital organs, particularly the myocardium; impatience has compelled him to operate before he obtained the maximum therapeutic response; faulty technic has resulted in mishaps; and failure to observe the clinical signs of approaching danger has made it impossible to circumvent grave sequelae. Experience has emphasized the importance of the following points.

PREPARATION OF THE PATIENT

The careful preoperative management of the patient is the best prophylaxis against complications. Impatience courts disaster. Routine care consists in: absolute rest, both mental and physical; the use of 1 c.c. of Lugol's solutions three times daily; the employment of a high calorie, high protein diet with extra feedings; and adequate fluid intake; and a careful functional study of all the vital organs. Should the heart show evidence of myocardial damage, as in decompensation or presence of auricular fibrillation, then the use of digitalis is beneficial. Slowing of the pulse, gaining in weight, the loss of nervousness, and improvement in the general

condition of the patient are the clinical guides that are useful in determining the time and type of operation. Little attention is paid to the basal metabolic rate of the patient. Experience dictates that multiple operations are very beneficial in the "bad-risk" patient. We do not hesitate to substitute ligations or lobectomies for subtotal thyroidectomies if the patient's condition warrants.

HEMORRHAGE

It is essential to have a dry operative field, as the slightest bleeding obscures the anatomic landmarks and invites trouble. Brisk bleeding from the superior thyroid arteries often startles the surgeon, and in his haste to catch the vessel, he may injure the recurrent laryngeal nerve. The following suggestions have been helpful.

In doing a thyroidectomy the gland is freed from its capsule, and the superior pole of one lobe is first separated from the fascia connecting it with the larynx, and is then elevated and grasped by two hemostats, which are applied from within, outward. If the clamps are applied to the superior pole from without, inward, the tip of the hemostats may pass by the superior thyroid artery and catch the terminal fibers of the recurrent laryngeal nerve as it enters the larynx. Hemostasis is facilitated by applying clamps to the lateral thyroid vein and to the inferior thyroid pole. The major blood supply to the lobe is now controlled by these three pilot hemostats, before any sharp dissection has been done. The dissection can now be carried over closed clamps without any troublesome bleeding. It is well to remember that if the points of the hemostats or the sutures do not pass outside the capsule on the posterior surface of the thyroid gland, the parathyroid bodies and recurrent laryngeal nerve will not be injured. It is advisable to remove all the thyroid tissue at the superior pole, as recurrences in this region are soon noted, but a small amount of tissue may be left at the inferior poles, as any enlargement there will pass into the upper mediastinum and not produce a deformity of the neck.

Should one be so unfortunate as to encounter a post-operative hemorrhage, extreme care should

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be used in evacuating the clot, lest the number of bleeding points be increased. Haphazard suturing of a bleeding thyroid bed, or careless application of hemostats may result in injury to the recurrent laryngeal nerve. Usually the offending vessels can be isolated and ligated, but occasionally there is such a diffuse venous oozing that a light gauze pressure pack is required.

TRACHEITIS

Tracheitis is occasionally a very distressing complication. It is largely prevented by; (1) preservation of the pretracheal fascia, (*do not denude the trachea*); (2) by protection of the lateral boundaries of the trachea by leaving a small triangular margin of thyroid tissue; (3) by gentle sponging by the assistant; (4) by avoiding the use of deep anesthesia. The formation of mucus is a defensive mechanism and is a direct result of tracheal irritation. Manipulations of the trachea cause dysphagia, and senile and debilitated patients often experience difficulty in expectorating the thick, inspissated plugs of mucus. Failure to remove the mucus causes a pulmonary hypoventilation, complete or partial atelectasis, and in many cases, bronchopneumonia. In mild cases, repeated doses of codeine sulphate are often beneficial, but if the patient can not raise the mucus and pulmonary embarrassment occurs, a tracheotomy may be a life-saving procedure. In cases of severe tracheitis, oxygen therapy has been beneficial by minimizing the production of mucus, by preventing the incidence of bronchopneumonia, and by lessening the cardiac load. All "bad-risk" patients are placed in an oxygen tent immediately after operation.

POST-OPERATIVE HYPERTHYROIDISM

A severe post-operative "thyroid storm" or crisis is seldom seen today, because of the better preparation of the patient resulting from the use of Lugol's solution as suggested by Plummer; because of a more careful technic at operation; and the anticipation and treatment of the complication before it arrives. All "bad-risk" patients are handled in the following manner.

If we anticipate a moderate post-operative reaction, the pregladular muscles and the skin are not closed, but the wound is dressed open. This permits a free drainage of the serum, which usually accounts for the hyperpyrexia. After the critical period has passed, the tissues can be approximated with impunity. The patient is kept very quiet by the liberal use of morphine, and the opiates also minimize the tachycardia. A positive water balance is maintained by giving sodium

chloride and glucose solutions, both intravenously and subcutaneously. Fluids are essential for renal elimination. Iodine is given immediately and if nausea or diarrhea precludes its oral or rectal administration, then some form, such as iodine-diasporal, can be given intravenously.

The warning signal of an impending crisis is sudden hyperpyrexia. The temperature may increase from 102°F. to 106°F. in less than an hour. The patient is very nervous, restless and delirious. The pulse is forceful, very rapid, and occasionally fibrillating. The patient complains of nausea, vomiting and diarrhea, and appears very ill. Unless the fever is controlled immediately the pronounced systemic reactions soon exhaust the patient. It is our practice to place 10 ice bags to the body if the the temperature is 102°F.; 30 ice bags if it reaches 103°F.; and the patient is submerged in an ice pack if the temperature reaches 104°F. The ice pack should never extend above the costal margin, nor should it be left on for more than two hours at a time. If the temperature again increased after removal of the ice, or remains elevated in spite of the pack, then the neck is opened. The skin flaps are freed, the pregladular muscles are separated and the wound is left wide open. The evacuation of a few drams of incarcerated serum will often result in a normal temperature. These patients are all placed in oxygen tents and receive repeated whole blood transfusions.

STRIDOR

Stridor following a thyroidectomy usually indicates injury to the recurrent laryngeal nerve, edema of the vocal cords, epiglottis or trachea, or compression of the trachea by a hematoma. One should not hesitate to perform a tracheotomy, as it affords immediately relief. Nothing will deplete the physical reserve of a patient more quickly than the exhausting efforts to breathe if the respiratory tract is obstructed. In the majority of cases, the emergency soon passes, and tracheotomy tube can be removed within a few hours, thus minimizing the possibility of wound infections and necrosis of the tracheal rings.

SCARS

One of the most distressing, yet avoidable, complications is an adherent scar, that moves with swallowing. It is a constant source of discomfort to the patient and is always noticed by others. The failure to approximate the pretracheal muscles and fascia permits the skin flaps to become adherent to the trachea. The neck should always be closed in layers; first, the

(Continued on Page 656)

The Treatment of Exophthalmic Goiter During the Immediate Preoperative and Post-operative Periods*

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ALTHOUGH the treatment of exophthalmic goiter is an old subject, our point of view concerning the value of various procedures is constantly being modified by increasing experience. Up to the time that iodine was introduced, improvements in treatment had gradually been developed until in the best clinics the mortality from operation was reduced to between 1 and four per cent.¹ At the same time, throughout the country as a whole, the mortality was probably between 10 and 15 per cent. It may be said that the relatively low mortality in the best clinics before the days of iodine was made possible by a realization of the importance of the following factors:

1. Operating only when the condition of the patient appeared satisfactory. It was realized early that operative procedures should not be carried out when the severity of the disease was increasing, or when the emotional manifestations of the disease were marked. The importance of increasing the body weight by the administration of a high caloric diet was also appreciated.

2. The skill and experience of the surgeon. It is only necessary to state that the Mayos' mortality was 25 per cent in their first 16 operations, 10 per cent in the next 300 cases and 2 per cent in the next 150 cases.¹ Most surgeons have had a similar experience.

3. The performance of multiple stage operations in all patients in whom there was some question about the ability to withstand operative procedures.

4. The type of anesthesia.

With the introduction of iodine, it became rather common to say that the treatment of exophthalmic goiter consisted in administering iodine for about ten days and then performing a subtotal thyroidectomy. It was said that iodine abolished crises and the need for multiple stage operations. So great did the reliance on iodine become that it was felt that other things did not

matter much in the preoperative treatment. It gradually became apparent, however, that while iodine had produced a great improvement, some patients were still dying in crises after operation, even when they had shown a satisfactory response to iodine in the preoperative period. The past few years have, therefore, been characterized by an attempt to gauge more accurately the role of iodine in the treatment and a growing appreciation of the importance of factors found to be of value before the introduction of iodine.

It seems appropriate at this time to present a summary of the immediate preoperative and post-operative treatment as developed in the past few years at the Rush Medical College and the Presbyterian Hospital in Chicago.² A survey of this outline clearly shows how important we have come to regard factors other than iodine. The treatment may be summarized under the following headings:

1. Administration of iodine.
2. Diet.
3. Rest.
4. Selection of the time and type of operation with special reference to emotional instability.
5. Treatment of complications.

ADMINISTRATION OF IODINE

So far as we are aware, any soluble form of iodine is effective^{2 3 4 5 6 7}, and the compound solution of iodine is no better than any other soluble form. The dose used probably does not matter within very wide limits. In the case of the compound solution it is probable, although not proved, that the minimum dose which will always produce a maximum effect is about 5 minims a day⁸. The importance of intravenous administration of iodine seems to have been greatly over-emphasized. So far as we are aware, its only indication is inability of the patient to absorb iodine from the gastro-intestinal tract because of prolonged vomiting. This applies particularly to the immediate post-operative period, when we administer iodine intravenously only if the vomiting persists more than ten hours. Then

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we administer one small dose of sodium iodide intravenously and repeat it in eight hours only if the vomiting persists. If vomiting continues long enough to make a third dose necessary, the condition of the patient is usually so serious that the most heroic measures are of no avail.

In the past there has been a tendency to operate as soon as the metabolism has shown a maximum reduction (usually ten days) because of the danger of a relapse if treatment with iodine is prolonged further. It has been our experience that the danger involved in continuing the administration of iodine for from two to three weeks beyond the time of maximum reduction is slight and the advantages from prolonged rest and a high caloric diet great. Indeed in some severe cases we have recently kept the patients in the hospital under careful observation for as long as three months, during which time iodine was administered continuously. In a few cases the basal metabolism will show a rise after its initial drop during the continuous administration of iodine and the patient become partially or completely refractory to iodine. We have noted that the omission of iodine for at least thirty days under such circumstances may be followed by a recovery of the ability of the patient to respond to iodine.⁹ Therefore, until evidence to the contrary becomes available, this would appear to be the best method of treating refractoriness to iodine.

It has been shown that large doses of iodine have no effect on the calorogenic action of tyroxine.^{10,11} Therefore, the only reason for giving iodine after operation seems to be to control any residual thyrotoxicosis caused by the removal of too little thyroid tissue. In patients in whom the removal of thyroid tissue has been adequate, the post-operative administration of iodine is probably of no value. However, since these patients usually can not be distinguished from those in whom the removal has been inadequate, it is best to administer iodine during the period commonly covered by the post-operative reaction (from five to seven days). In actual practice this is done most conveniently by continuing iodine until discharged from the hospital. When the removal of thyroid tissue is known to be inadequate, as for example, following a hemithyroidectomy, the administration of iodine is commonly continued until after the second operation.

Satisfactory results from treatment with iodine alone have been observed in patients who have the disease in mild form, both before any operative procedures are carried out and after oper-

ative procedures which have not been extensive enough to abolish the disease.^{12,13}

2. DIET

Gain in weight before operation is a favorable prognostic sign even if the metabolism does not drop, and when combined with a well marked reduction in basal metabolism, a mild post-operative course is almost assured. Failure to gain weight means only that the caloric intake is insufficient. In order to make the patients gain weight, it is usually necessary that the caloric intake exceed the basal caloric expenditure by at least 100 per cent. This means that in most instances the intake must be between 4,000 and 5,000 calories daily. Operation should rarely be carried out unless the patient gains weight. The old practice of restricting protein is probably harmful because of the rapid breakdown of body tissues in exophthalmic goiter as indicated by the high nitrogen excretion. A diet which is ample in calories will usually contain sufficient protein to replace lost tissue. A dose of Lugol's solution may be administered four hours before operation with a carbohydrate meal, for example, 250 c.c. of orange juice and an average sized helping of oatmeal with milk. This will be out of the stomach by the time of the operation and helps to prevent an acidosis just after operation. It is rather pathetic to see patients with exophthalmic goiter kept on the usual post-operative liquid diet, which consists largely of broth. Because of the accelerated breakdown of tissues during this period, the caloric value of the diet should be as high as possible. If the patient is in good condition before operation, vomiting from six to eight hours can usually be well tolerated. If vomiting persists beyond eight hours, 10 per cent glucose may be administered subcutaneously by a suitable method in sufficiently large amounts so that, together with retention enemata, the fluid intake in the first twenty-four hours will be about 3,000 c.c. During the time that the patient is having difficulty in swallowing, a diet of half milk and half 20 per cent cream can usually be administered in sufficiently large quantities to supply a satisfactory number of calories, although some loss of weight is almost unavoidable. The main thing is to see that the patient gains enough weight before operation to withstand the loss that occurs in the immediate post-operative period.

3. REST

The restoration of muscle tone, as shown by the ability of the patient to walk about the ward with ease is of value, in association with other things, in gauging the risk of operation. It is

fair to say that patients who are able to walk are able to withstand the strain of operation better than patients who are bedridden. On the other hand, it has been clearly shown that rest exerts a beneficial effect on the course of the disease and the patient should spend a large part of the day in bed. The freedom from the daily routine of home, which is provided by the hospital is in itself justification for not carrying out the preparation for operation at home.

4. SELECTION OF THE TIME AND TYPE OF OPERATION

The selection of the time of operation is more important than the selection of the type of operation. Operative procedures should rarely be carried out in patients who are losing weight, showing an increase in their basal metabolic rates, or who are very unstable emotionally. In estimating the ability to withstand operation we pay great attention to the degree of emotional instability and in cases in which it is marked we postpone operation several weeks, even if other things appear satisfactory. Plummer¹⁴ showed years ago that the severity of the post-operative reaction appeared to be roughly proportional to the pre-operative intensity of the emotional instability. Our experience has been that emotional instability is diminished with rest, provided the rest is prolonged enough. The main thing to bear in mind is that miracles can not be accomplished in the post-operative period and the time to prevent post-operative crises is in the preoperative period.

The need for ligations has practically disappeared. Studies of the basal metabolism and the clinical condition of the patient show no clear cut change following the ligation of both superior and both inferior thyroid arteries. Its only role would appear to be to test the ability to withstand operation, in doubtful cases. Although Richter¹⁵ does not agree, most surgeons are of the opinion that the risk of operation is less the smaller the amount of tissue removed. However, in our experience, a subtotal thyroidectomy may usually be done if great attention is paid to getting the patient into a suitable condition beforehand. Hemithyroidectomies need to be done only in those patients whose ability to withstand operation is doubtful and in patients whose condition, for some unknown reason, becomes bad during operation. In making the decision about the extent of the thyroidectomy Lahey¹⁶ has stressed the importance of considering the severity of the disease on admission to the hospital instead of the immediate preoperative severity. Clute,¹⁷ of the same Clinic, thinks hemithyroidectomies should

be done in at least 25 per cent of the cases. We doubt if the percentage needs to be this high. Nevertheless, when in doubt, it is best to reduce the amount of surgery. Only when the condition of the patient becomes poor during operation should the decision about the extent of the procedure be made at the operating table. Then the operation should be stopped as soon as possible. The behavior during the thyroidectomy does not seem to be a very satisfactory index of what will happen in the post-operative period.

From observation of a large number of patients over a period of several years, it would appear that the severity of the post-operative reaction, the incidence of complications of thyroidectomy and the incidence of persistence of the disease after operation are directly related to the skill of the surgeon.¹³ However, while the skill of the surgeon is of great importance, we doubt whether it is quite so important as getting the patient in proper condition for thyroidectomy. Indeed success in the treatment of exophthalmic goiter depends upon co-operation between the physician and the surgeon and in the treatment, operative procedures should be regarded as merely important incidents.

5. TREATMENT OF COMPLICATIONS

A. Cardiac Irregularities—It is our impression that cardiac irregularities have been regarded too seriously in determining the ability to withstand operation. We have sometimes pleaded in vain with surgeons to operate on patients with auricular fibrillation who appeared to be in good condition otherwise. The criteria for operation are about the same in patients with cardiac irregularities as in patients without. In particular we regard auricular fibrillation in the absence of other untoward signs as of minor significance. This dictum applies not only to the preoperative period but also to the immediate post-operative period when transient auricular fibrillation is a fairly common occurrence. Cardiac irregularities probably are an indication for prolonging somewhat the period of rest before operation, but, if the patient has gained weight, shows some reduction in metabolism and the emotional instability is not marked, cardiac irregularities in the absence of decompensation may be almost disregarded in predicting the outcome of operation. The indications for the use of digitalis and quinidine are still not well defined. We rarely use either drug in the treatment of exophthalmic goiter.

B. Tetany—The incidence of tetany varies somewhat in different clinics, being between two

and three per cent in the group of cases we have followed in the last few years. It usually develops on the second day after operation and the first symptom is commonly numbness and tingling of the hands followed in a few hours by carpal spasm. It is very important to observe the patient carefully, so that tetany may be detected as soon as it develops. Unless the condition is marked, the patient can be treated satisfactorily by administering nothing more than calcium chloride by mouth in a dose of 15 grains every four hours. If the tetany is present in a severe form, then one or two intravenous injections of 10 c.c. of 10 per cent calcium chloride may be necessary until calcium is absorbed from the gastro-intestinal tract. Parathormone usually acts only temporarily and its use is rarely necessary. Tetany is usually permanent although an adjustment often occurs to the lowered level of serum calcium so that the immediate symptoms are more severe than the subsequent ones. Moreover, the concentration of calcium in the serum not infrequently rises, although usually not completely to the normal level. The patient must be watched indefinitely.

It has been suggested from the Lahey Clinic¹⁸ that the incidence of tetany may be reduced by searching all thyroid tissue removed at operation for parathyroid glands and implanting any that may be found in the sternomastoid muscle.

C. PARALYSIS OF THE VOCAL CORDS AND LARYNGEAL EDEMA

Paralysis of one vocal cord is common, usually occurring in at least five per cent of cases in most clinics. It almost never causes serious difficulty in breathing, but when combined with marked laryngeal edema may cause considerable discomfort for three or four days. The paralysis is not evident until the day after operation in about half of the cases. Paralysis of both vocal cords is rare, but when it occurs the difficulty in breathing is marked for three or four weeks, especially if the paralysis is associated with edema of the larynx. In spite of the marked difficulty, a tracheotomy usually is not necessary. In patients who develop paralysis of one or both vocal cords and laryngeal edema frequent inhalations of vaporized compound tincture of benzoin produce relief. It is of practical importance that well marked huskiness of the voice after operation usually means that one vocal cord is paralyzed. The paralysis is permanent in most cases, although it may disappear as long as eight months after operation. Varying amounts of laryngeal edema and tracheitis may be regarded as complications of all thyroidectomies.

By applying the principles outlined here to the treatment of exophthalmic goiter in the Cook County Hospital during the past year and one-half, it has been possible to reduce the operative mortality from about 14 per cent to between one and two per cent. This reduction has been accomplished without any change in the surgical personnel and without any significant change in surgical technique.

SUMMARY

The single most important factor in determining the risk of thyroidectomy for exophthalmic goiter would appear to be the preoperative condition of the patient. In order to keep the mortality at the lowest possible rate, great attention must be paid not only to the administration of iodine but also to the administration of a diet sufficiently high in calories to make the patient gain weight, to the control of emotional instability and to rest. There should be no hesitation about postponing the operation until the condition of the patient appears satisfactory. Other factors in the order of their importance would appear to be the skill of the surgeon, selection of the time and type of operation and the administration of a sufficient amount of fluid and a sufficient number of calories in the immediate post-operative period.

The treatment depends upon intelligent cooperation between physician and surgeon. The main points to be emphasized are that the battle is won or lost in the preoperative period, that the operative procedures themselves are merely important incidents and that miracles can not be performed in the immediate post-operative period:

As a result of applying the principle outlined to the treatment of exophthalmic goiter in a large municipal hospital, it has been possible to reduce the mortality following thyroidectomy from about 14 per cent to between one and two per cent.

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PREVENTION OF COMPLICATIONS IN THYROID SURGERY

(Continued from Page 651)

severed margins of the thyroid capsule are united with interrupted sutures, then the preglandular muscles are approximated, and finally the fascia of the preglandular muscles is drawn together by a continuous catgut suture. The interposed muscles and fascia thus prevents union between the skin flaps and trachea.

PARATHYROID TETANY

Fortunately parathyroid tetany is not very common. Removal of one or even two parathyroid glands may produce such a mild, transient disturbance in the phosphorous and calcium metabolism that it passes unnoticed. The parathyroid bodies may be excised, they may be crushed by a hemostat, or their blood supply

obstructed by a ligature. If, during dissection, all hemostats and sutures are prevented from penetrating the posterior one-third of the thyroid capsule, then injury to the parathyroid glands will be extremely rare. McCullagh has pointed out that large doses of calcium, as calcium lactate or gluconate, will control the tetancy in most instances, without the addition of parathormone. In acute and severe cases, parathormone is more efficacious.

PSYCHOSIS

Many of the psychoses developing after thyroidectomy are co-incidental and have no etiologic relationship to hyperthyroidism. It must be remembered that hyperthyroidism may aggravate an existing psychosis and that a psychosis may accentuate hyperthyroidism. A careful inquiry into the family history will usually reveal an hereditary psychogenic background. The forms most commonly encountered are neuroses, shizomanias, and paranoid tendencies. Operative procedures are contraindicated in the presence of a psychosis. However, it must be remembered that there is a true, toxic thyrogenic psychosis, not unlike that seen in any septic condition. If the delirium persists for more than seventy-two hours, the prognosis becomes grave.

SUMMARY

1. The morbidity rate can be reduced by preventing post-operative complications.
2. A thorough preoperative preparation of the patient, careful conduct of the operation, and anticipation and early treatment of complications will lower both the mortality and morbidity rate.
3. Such complications as post-operative hemorrhage, injury to the recurrent laryngeal nerve, parathyroid tetany, adherent scar, stridor, and acute "thyroid storms" or "crises" can be prevented by the proper management of the patient.



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MALIGNANCY OF THE THYROID GLAND

The incidence of neoplastic changes in the thyroid gland is usually quoted as from 1 to 6 per cent of all cases in which the thyroid gland is the primary site of the disease. It is also estimated that 2 to 3 per cent of thyroid adenomata are the site of malignant metamorphosis so it is therefore evident that the subject of treatment of these lesions is one of considerable importance. Because of the discouraging results obtained and the reluctance to report cases in which treatment was unsuccessful in the early days when surgery alone was undertaken, few cases were reported. The literature has increased, however, since surgical therapy has been combined with the employment of radium and high voltage roentgen rays to aid in the attack on these lesions.

Wilson has stated that the correct early diagnosis of carcinoma of the thyroid gland is made less frequently than that of malignancy of any other organ. It is evident that too often the diagnosis is arrived at so late that a distant metastatic growth becomes apparent before the original primary tumor is discovered in the thyroid itself.

Malignancies of the thyroid gland arise in about 90 per cent of cases in long standing pre-existing nodules and therefore it is fre-

quently impossible to diagnose them early by clinical methods. Because of this fact and because of the small operative risk in their removal, surgical excision of all these adenomata should be advised as the treatment of choice, and as a most important measure in the prevention of malignancy. This form of treatment should be carried out regardless of whether hyperthyroidism exists or not. By the time clinical methods reveal definite signs of malignancy of the thyroid gland, palliative treatment is usually all that can be offered, since extension of the neoplasm outside the capsule has occurred. Early metastasis from carcinoma of the thyroid may take place and this then involves the regional lymph nodes, lungs, bones, brain and viscera. This is accounted for by the rich blood supply to the gland and the proximity of the gland to the large veins and to the cervical lymphatics.

In spite of the fact that the therapy of malignancy of the thyroid gland has been long considered hopeless, much evidence has been presented to show that the condition is curable. Pemberton, in discussing the treatment of this disease, has classified carcinoma of the thyroid gland into several distinct types, (1) papillary adenocarcinoma, (2) adenocarcinoma of an adenoma, (3) diffuse adenocarcinoma, and (4) spindle cell carcinoma resembling sarcoma. The papillary adenocarcinoma

is of low grade malignancy and grows slowly, while the rare spindle cell type grows speedily, produces early distant metastasis and is almost without exception rapidly fatal. Because the rate of growth of papillary adenocarcinomas is slow and because malignant adenomas have a tendency to remain encapsulated for a long time, simple thorough removal of either of these types will usually suffice. Even when extension outside the capsule has occurred and the malignant process has reached the adjacent lymph nodes, radical surgical removal has proved to be a satisfactory procedure, although more from the standpoint of palliation than cure. High grade malignant growths of the thyroid gland are treated preferably by a combination of wide surgical excision followed by radiotherapy, because of the fact that these lesions respond quite remarkably to radium. In extensive growths which are totally inoperable, palliation may be obtained by radiation therapy alone, but as a general rule surgical excision preceding this form of treatment is indicated. Therefore, the type and the result of treatment varies with the histologic structure of the lesion.

Sarcoma of the thyroid is a lesion of extreme rarity although it occasionally does occur. Its treatment is essentially the same as that for carcinoma and its prognosis is no brighter.

M. N.

THE CENTURY OF PROGRESS

The doctor who is anything of a museum fan, something that the average doctor is likely to be, could scarcely fail to be pleased with the Century of Progress and full of admiration for the management and the exhibitors. This would be true almost irrespective of how little or how much time he spent at the fair or how tired he became. It would be true no matter how much he might fail to be reconciled to some modern features such as the style of architecture and certain points in the mass grouping or arrangement.

The features of any fair could be classified as educational, amusement, and commercial, but the last two named are likely to crowd out or cover up the first. The last statement could not be made of the Century of Progress, where the educational or instructional feature was very strong. Moreover, unlike perhaps in any other fair, the information presented stressed processes, development, progress, hence the name "Century of Progress." This seemed to be true of all scientific exhibits and

of very much, if at all, of the commercial exhibits.

Of the medical exhibits it is not necessary to indicate their extent, to list the organizations that took part, or to say that modern devices such as radio, moving pictures and illumination made possible a certain amount of pleasing variation from the good old standard methods of specimen, model, and chart. Nor will anything be said about the commercial exhibits of drug and supply houses, many of which are truly instructive and admirable. The scientific medical exhibits could be grouped, roughly at least, into three classes: (1) story, history or process; (2) present day information, knowledge or practise; (3) the curious, the spectacular. But, as in most efforts at classification, the groups overlap. The story ended with present day information or practise, present day knowledge might border on the spectacular, possibly nothing should be thought of as spectacular alone.

Of the first group there were scores if not hundreds of historical sketches told in a variety of ways. There were: the story of hospitals, the story of medical practise, the story of medical education, the story of the microscope, the story of anesthetics, the story of bacteriology, the story of antiseptic and aseptic surgery, the story of vitamins, the story of insulin, the story of the use of any particular drug or treatment. The list could be continued almost indefinitely.

Of the second group, one would recall particularly such exhibits as those on cancer, arthritis, anemia, the sympathetic nervous system, etc., the public health exhibits in general, and the sections, jars, and models illustrating anatomy and physiology.

As said above, it is probably unfair to list anything as simply spectacular. In the group that I have called curious or spectacular, however, one would think of many books, pictures, instruments, and other objects that are old and rare and full of delightful historical interest. One would also think of the so-called "glass man," some of the anatomical sections, and some of the mechanical models illustrating facts of physiology; not but what the information intended to be conveyed was good, but that to the doctor it was elementary and to the layman it was probably largely lost in the mechanics and the novelty. These exhibits, however, attracted much attention.

The information presented, while interesting

to the doctor from the points of view of history, clear statement of fact, and even the way in which it was done, was obviously addressed to the average layman. It was clear and accurate, and interesting if one may judge from the large numbers that stopped to look on. What the layman got out of it should have been limited only by the time and attention he could give. Along with whatever information he may have picked up, the layman should also have received the impression that modern medicine rests upon a scientific basis and that its interest is to relieve suffering and eliminate disease.

H. E. F.

WILL AND WORK BUT CAPACITY COMES FIRST

How often one hears the expression "you can be anything you want to be," "you can succeed if you but will," and then the humble beginnings of great men are cited as if it were an advantage to have such a handicap. The horse behind in a race may be spurred to greater effort by seeing his rival in the lead, but this can scarcely be called an advantage. No one would seriously contend that the eloquence of Demosthenes was attributable to an impediment of speech which in youth he learned to overcome, and yet, this illogical inference is suggested to some by that story. Eloquence and oratory to the contrary notwithstanding, a handicap is a handicap, and to fail in its recognition is a serious mistake.

Physicians become impatient with such sophistry because every now and then they see an ambitious youth who, beguiled by pep talks and hypnotized by the siren lure of some will-o-the-wisp dazzle, overdo and neglect their health with resultant malnutrition, shattered nerves and deficiency disease.

To admonish the young against lazy habits is all right in its place, but this "hitch-your-chariot-to-a-star" stuff may be overdone. To will and to work are wonderful words to conjure with, and we applaud those who respond to their inspiration, but they are also fraught with danger and may cause havoc unless there is capacity to back them up. After all, we are not created equal, and it is the stuff that each is made of that is the fundamental factor. "Beware of the precocious child," is a dictum among teachers because they "burn out," and physicians know that unusual intellectual brilliancy is frequently due to hyperthyroid activity. Such children should not be over-stimulated. It takes more than will power to lead the pack. It takes capacity.

A. E. H.

ECZEMA

The discovery of new facts that broaden conceptions relative to the etiology of diseases that afflict man is always welcomed by the medical profession. When dealing with eczema, the physician is confronted with a condition of obscure origin that is comparatively easy to diagnose but difficult to conquer, and lack of knowledge as to the cause of this refractory condition of the skin does not simplify its successful treatment.

There is reason to suspect that the etiology of eczema may be varied and complex. Allergy, ductless gland disturbances, and dietary deficiencies with respect to vitamins and fats are intimately associated with the development of pathological changes in the skin, and the role played by each of these different factors is by no means completely understood.

During the past few years, some attention has been directed toward an investigation of the chemistry of the blood of patients with various dermatological conditions. For example, Klauder and Brown¹ found the total calcium, the diffusible calcium and the potassium—diffusible calcium ratio to be normal in cases with eczema. Also, Schamber and Brown² report that in eczema there is a perceptibly higher percentage of cases with an excess of non-protein nitrogen, urea nitrogen, and uric acid in the blood than in other dermatoses, and expressed their belief that a study of the blood chemistry of patients with refractory dermatoses is of material aid in prescribing appropriate dietaries.

Recently, at the University of Minnesota, Dr. Arild Hansen³ has observed in a limited number of cases that the unsaturated fatty acids of the blood serum are abnormally low in children with eczematous lesions, and that improvement in skin conditions of this character occurs when the uncatrated fatty acid content of the blood is restored to normal by feeding certain oils (corn or linseed oil) rich in these fatty acids. These observations may mark the identification of one of the important factors responsible for the development of eczematous skin conditions, and if confirmed by additional studies now in progress, they may aid in placing the therapy of eczema on a rational, but somewhat revolutionary dietary basis. Thus in the future, we may see the physician prescribing a diet rich in unsaturated fatty acids rather than advising the patients with eczema to avoid fats as is commonly done at present.

The investigations of Dr. Hansen have opened a new field bearing on the relationship between

the metabolism of fats and physiology of the skin and promises to yield important clues relative to the etiology and treatment of eczema.

1. Klander, J. V., and Brown, H.: *Arch. Dermat. and Syph.*, 22: 877, 1930.

2. Schamberg, J. F., and Brown, H.: *Arch. Dermat. and Syph.*, 21: 1, 1930.

3. Hansen, A.: *In press. Proc. Soc. Exp. Biol. and Med.*

C. A. S.

AH-GWAH-CHING

Most of us are aware of the excellent effort being carried on by Dr. H. A. Burns and his staff at the Minnesota State Sanatorium at Ah-Gwah-Ching, near Walker, but it has remained for a distinguished observer from Canada to epitomise the high points in such a way as to afford a most comprehensive and informative review of the splendid work of this institution. Dr. H. W. Hill, Director of the British Columbia Provincial Board of Health Laboratories has issued a complete supplement to the regular bulletin of the British Columbia Board of Health, devoted entirely to an analysis of the work at Ah-Gwah-Ching, interspersed with comment which is favorable and complimentary throughout. The bulletin is divided into four articles, covering (1) One Sanitarium Program; (2) Some Details of Practice; (3) Epidemiological Service and (4) The Attitude of the Patients.

He emphasizes the three guiding principles which underlay the activities of the institution.

1. Only patients showing tubercle bacilli are considered properly acceptable.

2. Only if these patients become tubercle bacilli free are they considered properly dischargeable.

3. Accepted cases are investigated by the Field Epidemiologist to discover the sources of infection and to prevent any further spread from these sources.

He says in summary:

"A great State Sanatorium, serving a popula-

tion of about 800,000 people (the rest of the state served by the fourteen county sanatoria), is being successfully operated on these principles: That tuberculosis is a communicable disease; that the physician is responsible for the finding and treatment of tuberculosis; that the public sanatorium should be for the isolation of open cases; that closed cases should be at home or equivalent (private sanatorium hospital, etc.), under the treatment of an attending physician; finally that the sanatorium should conduct through its own epidemiological service, concrete specific search for the actual sources of infection in all cases possible, with the object in view of securing the eradication of these sources.

Finally, the figures given are most illuminating. He says:

"The present situation is most promising. The deaths annually from all forms of tuberculosis in 1911 were about 2,500, a rate of about 119 per 100,000. The deaths are now barely over 1,000, a rate of about 41 per 100,000. There are available for tuberculosis, in county sanatoria alone, 1,705 beds, in the State Sanatorium, 350, and other institutions have a potential capacity of about 700 to 800 more. This gives nearly two sanatorium beds to each death, nearly three beds to each death, if the subsidiary institutions be included. This, if the open cases annually be calculated as about three times the deaths, it is physically possible in Minnesota to house in sanatoria almost the total theoretical open cases of the state.

"Such a procedure," he concludes, "really carried out for five years, could not fail to practically wipe out the disease in the state."

Coming from such a source, that of a competent, impartial outsider, these words are highly comforting and encouraging.

G. C.



Proceedings Minneapolis Clinical Club

Thursday, October 12, 1933

The President, Dr. H. Bright Dornblaser, in the chair.

SYMPOSIUM ON SYPHILIS

THE SYPHILITIC CHILD

DR. EDWARD D. ANDERSON

SUMMARY

Attention is called to the rarity with which congenital syphilis is seen in private practice today.

Venereal prophylaxis and increased use of the Wasserman test in pregnant mothers are chief causes for lessening of incidence of congenital syphilis.

This is followed by discussion of value and interpretation of Wasserman reactions in infants and children.

The dosage and methods of administration of various forms of mercury, arsenic and bismuth is discussed.

The dosage and method of administration of spirocid is considered more in detail.

NEW DEVELOPMENTS IN THE TREATMENT OF SYPHILIS

DR. D. D. TURNACLIFF

SUMMARY

1. Any new developments in the treatment of syphilis have not been along the line of new drugs but in stabilizing our therapy from our experience.

2. Clinico-pathological reactions in the body are presented.

3. Relative values of drugs as therapeutic agents are arsphenamine 6, bismuth 4, mercury 2.

4. Total arsphenamine dosage of 20 to 24 gms. is emphasized as the minimum in order to have maximum results.

5. The alternating of drugs is recommended.

6. Bismuth is recommended as the drug to be used for first treatment in order to avoid Herxheimer reaction.

7. Total therapy in early active and latent groups is discussed.

8. Accuracy of diagnosis of latent lues is questioned in many cases.

9. Continuous and often overlapping therapy, with elimination of rest periods, is advised during the first year.

NEUROLOGICAL MANIFESTATIONS IN LATE SYPHILIS

DR. J. C. MICHAEL

SUMMARY

The manifestations in late neurosyphilis are quite logically investigated under three headings: (1) neurologic; (2) psychiatric; (3) serologic. At the outset it should be emphasized that we cannot do safely without any of these, neither may we be too positive of the significance of each without confirmatory collateral evidence. It is important to determine the type of neurosyphilis because treatment and prognosis vary considerably.

Anatomic and clinical groupings are outlined under two main headings: (1) meningo-vascular; (2) parenchymatous. The distribution of the various clinical types and the main signs and symptoms are considered. The most difficult diagnostic problems arise when findings are negative in one or two of the three mentioned fields of investigation.

DISCUSSION

DR. H. L. ULRICH: Syphilis is a vanishing disease to me. The old aphorism of Dr. Osler—"He who knows syphilis knows medicine"—does not hold true any more. Generally speaking, it appears to be a different disease from what it was twenty-five years ago.

I have gone through the whole phase of the discovery of the treponema pallida and the evolution of the therapy of the arsenicals down to the present day attitude. I have a certain residue of ideas about it all but it is not worth much.

One of the residues is in regard to the treatment of syphilitis. We are told how to treat syphilis by giving injections so many times a week, so many times a month, so many times a year—a sort of a standardization which is impossible when dealing with human problems. Again very little has been said about the effect of all these heavy metals (mercury, arsenic, bismuth) on the patient. I have an impression that the collateral effect on the tissues of the host aside from the spirochetecide action of these metals is considerable. I have noted undue vascular changes—sclerosis of the viscera, particularly

the liver, in syphilitics which I thought might be due to the treatment rather than the disease.

Occasionally I have seen some remarkable results in poorly treated cases who become free in their clinical date but retain laboratory evidence of syphilis. One case of a physician who became sensitive to arsenic and mercury (bismuth was not used at that time) and stopped treating. He had a positive spinal fluid. He is perfectly well today. There is a lot of biological data about syphilis which does not correlate with treatment or systematization of the disease.

DR. E. S. PLATOU: I can certainly subscribe to the already stated fact that congenital syphilis is a vanishing disease in practice. This is not surprising, of course. The alertness of practitioners in discovering the disease in the prenatal state and the early treatment instituted in most cases account for the decline.

One important point in the diagnosis of congenital syphilis, it seems to me, is the proper evaluation of meager and sometimes misleading clinical findings. For this reason Serological examinations and skeletal X-rays are of particular importance.

May I emphasize the unreliability of the Wassermann test in the new-born. I think a worthwhile observation in this regard is that of Caffey, whose statistics show the Kahn test to be more exact than the Wassermann in the parturient woman.

In the treatment of congenital syphilis of infancy I should like to stress the importance of the nutritional phase and the avoidance of dangers attendant to the early use of arsenicals. Mercury is probably the safest drug to begin with, reserving the arsenicals and bismuth for subsequent alternate treatment. Of these sulpharsphenamine, neosalvarsan and Bismogenol seem preferable at the present time. There has been a great deal in the literature during the past two years about the use of Stovarsol by mouth. The reports of Abt, Maxwell and others have been enthusiastic. There are some possible objections to this. In the per-oral method there may be a tendency on the part of the parent to neglect the treatment. More should be known of the adequacy of this form of treatment within safe limits of dosage. Reactions have been reported.

I think Dr. Turnacli's remarks pertaining to the omission of rest periods is particularly applicable in the treatment of congenital syphilis. At the Vanderbilt Clinic no rest period is permitted during the first year, very little during the second year and only an occasional one, depending on the blood and spinal fluid serology, during the third year. Alternation in drugs with brevity in rests is probably safer and more efficacious than other methods of treatment so far introduced.

Following the administration of these drugs in congenital syphilis, even closer observation is necessary than is true in the acquired form of the disease. Albuminuria, frequency of stool, fever, skin eruption, or any departure from normal health is a very important danger signal during therapy. Treatment for three years with observation at least two years thereafter is

certainly the best safeguard against the tragedy of recurrence.

DR. M. H. NATHANSON: Last year at a pharmacology seminar one of the chemists associated with an eastern drug house gave an interesting talk on the various arsenicals. He made several statements which surprised me, indicating that they are going back to the old salvarsan in many of the eastern clinics and that there had been a tendency to eliminate bismuth and return to mercury. He made another statement which was entirely new to me, that in some cases in which the Wassermann reaction remained positive after prolonged use of arsenic and bismuth, sodium theosulphate may change the reaction to negative.

DR. C. J. EHRENBERG: Do you consider there is an abortive treatment between the primary and secondary stage of syphilis?

DR. R. SWANSON: May I ask Dr. Ulrich why five or ten years ago there was so much in the literature on false positives in pregnant women? There were many articles on it which reported a tremendous number of Wassermann tests on pregnant women with false positives.

DR. M. H. NATHANSON: In what percentage of neurologic syphilis do we find involvement of the aorta?

DR. ERLING HANSEN: I am rather surprised to hear Dr. Ulrich speak of syphilis as a vanishing disease. Last spring I was asked to read a paper before the Central Wisconsin Eye, Ear, Nose and Throat Society. It happened that just previously I had seen a group of undiagnosed cases of syphilis, which had been under treatment for from six weeks to several years, none apparently recognized as luetic. There were destructive processes in the throat—ulcerative pharyngitis and laryngitis—in the soft palate, in the nose and accessory sinuses, and one of nerve deafness. The latter I reported briefly to this group last year, a woman with Argyll-Robertson pupils and a positive spinal fluid, unquestionably congenital syphilis with late manifestations.

Not infrequently we see children and young people who develop interstitial keratitis, without any other apparent stigmata of congenital lues. Sometimes these are present in mild form and might be picked up on very careful examination.

Taking all in all, it seems to me there must be a large number of people, if those we see in our work alone are any criterion, with untreated syphilis. The question of whether treatment or no treatment is better for some of the luetic cases does not enter into the field where there are destructive lesions in the nose and throat, producing deformities and scarring which interfere with breathing, swallowing and phonation. The treatment of these, particularly early, seems only a little short of magic.

I have not Dr. Ulrich's background with his long years of practice and perhaps he did see more syphilis and more clinical manifestations of it in days gone by. Unquestionably, syphilis is being recognized and being treated earlier, but I still think there are a lot of

people who had no thought apparently of the disease, had no blood Wassermann tests and certainly no spinal fluid examinations. Just recently I saw a woman who gave a history of a "nervous breakdown" seven years ago, who had been diagnosed as a neurasthenic, a neurotic woman, etc. She had nerve symptoms, tingling numbness, etc., and had been checked up for pernicious anemia and finally developed double vision. She came in for that, and then we found a positive spinal fluid. I think we all ought to be on the lookout for syphilis in whatever branch of medicine we may be in.

DR. FLOYD GRAVES: Six or seven years ago we used to hear much about false positive Wassermann tests in pregnancy. I never could believe that was possible because the Wassermans I did on pregnant women, when positive, usually proved out to be positive for syphilis.

The only case I remember was doing a Wassermann on a pregnant woman for a certain doctor which came out a four plus positive with cholesterinized antigen but gave a clear negative with alcoholic antigen. We considered that the cholesterine antigen gave us a false positive and ignored the result on account of the negative in the alcoholic antigen. This proved to be true in this case. This experience convinced me that it is desirable to use all serums with a number of antigens. It is a good method of control.

False positive Wassermans are much rarer today than formerly on account of the better methods of preparing antigens.

DR. A. CARDLE: May I ask Dr. Turnacliiff when he feels treatment should be terminated?

DR. ROBERT P. CARON: How long is syphilis infectious, and how soon may the patient assume marital relations after the beginning of active treatment?

DR. J. C. MICHEL: The question about the incidence of cardiac and aortic involvement in neurosyphilis, I can answer by saying, first, that in postmortems it is not uncommon to note syphilitic scars involving the aorta. There have been some figures reported on the interrelationship between heart and nerve involvement; and if my memory serves me correctly, in about one-half of the neurological cases the clinician is able to demonstrate some cardiac and aortic impairment. Indeed, in our teaching program we emphasize the importance of complete cardiac examination in the neurosyphilitic patient. Conversely, the internist must equally provide for neurological examination when he deals with heart disease and syphilis.

Then, about the incidence of syphilis in general, I do not think we can say that in our clinics and in private cases we find a considerable lessening of luetic patients. I do believe, however, that in Europe and in this country there has been a diminution in the incidence of primary syphilis since the war.

Dr. Turnacliiff suggested that I say something about the treatment of neurosyphilis. While that might take me far afield, I will confine myself to some general remarks. We used to be very pessimistic fifteen or twenty years ago about the outcome of patients with neurosyphilis. Those days, I remember very well my-

self. A great change has come about, however, in this respect. Whereas formerly we had the most hopeless feeling about the therapeutic results, for instance, in dementia paralytica, more recently we have come to recognize the more favorable possibility. Some six years ago, when I reviewed the clinical progress of 21 paretics treated in the early or moderately advanced stages, the remission rate was found to be 64%. Before long we hope to prepare another review. As concerns the meningo-vascular group, the treatment possibilities are indeed very promising. Occasionally, when massive nerve lesion has occurred, the outlook is not favorable. The outline for treatment in this group is very similar to that just presented by Dr. Turnacliiff. The physician must particularly guard against starting treatment with too great doses of arsenic. In tabs we hope mainly to arrest the disease process. The crises present particularly stubborn treatment problems. Tryparsemide, I find to be of considerable help. Progressive optic atrophy is by far most difficult to influence by any known form of treatment. Malaria is applicable to some selected cases both in the tabetic as well as in the meningo-vascular group. Inoculation should be considered only when we know that the better known chemotherapeutic procedures prove to be unsatisfactory. Malaria is still the best in the treatment of dementia paralytica, though it is not an ideal method. The possibility of malarial complications make it necessary that one limit its induction to patients who cannot be treated effectively otherwise. Recently we have been hearing a good deal about diathermy and radiothermy in dementia paralytica. I feel quite cool towards the mechanical fever production methods. Histopathological studies have confirmed our ideas of the efficacy of malaria in dementia paralytica; I know of no such studies excepting one by Walter Freeman of Washington, D. C., who has had the opportunity to study a case treated by diathermy, post mortem. His observations were that the pathological picture had not been altered by that form of treatment.

DR. D. D. TURNACLIFF: Unfortunately, I was unable to hear all of the remarks of Dr. Ulrich and I am very sorry that I could not because he always gives us good advice. I did, I believe, understand Dr. Ulrich to say that there is perhaps some question but that the use of certain drugs might create as much damage as the syphilis itself.

Just as a first thought which comes to me and perhaps answering that question, is that aside from the acute reaction which should be avoided and which the men using the drugs a great deal are learning to avoid more and more, the pathologist reports many scars of syphilis but very few, if any, from the drugs.

Someone asked when to terminate therapy. It is too long a story to go into except in a general way to make the statement that three years and the patient is clinically and serologically negative. If the patient is clinically active, of course, continue some form of treatment, allowing time, of course, to see what the body forces will do.

The question was asked regarding marital relations.

I would say that if the patient were single he ought not be married until his case is cured or arrested. If already married, I would say that I believe hardly any patient who is on real therapy is liable to infect anyone but the only thing is that both sides must know the situation, otherwise it cannot be handled.

Concerning the question of abortive treatment, we do not know whether six, eight or ten neosalvarsans in an intensive course will sterilize a patient or not. We have no way of checking that out. We are dealing with a generalized process, it is not a localized process at all. I could answer the question with one specific case where a husband, a traveling man, came home and found that he had exposed his wife the night before. His wife was given one dose of arsphanamine and then ran home to mother, coming back three months later with a secondary infection.

JAMES K. ANDERSON,
Secretary.

SOCIETIES

THE RADIOLOGICAL SOCIETY

The Minnesota Radiological Society held its fall meeting at the St. Paul Athletic Club, St. Paul, November 11, 1933. The following program was presented:

1. "Osteochondritis Juvenilis Deformans (Perthe's Disease): Report of Cases," W. L. Burnap, M.D., Fergus Falls.

2. "Observations from a Clinical Tour," M. A. Shillington, M.D., St. Paul.

3. "Pneumonia in Young Infants Associated with the Aspiration of Various Oils," Kano Ikeda, M.D., St. Paul.

4. "The Roentgen Diagnosis of Placenta Praevia," Walter H. Ude, M.D., Minneapolis.

5. "The Improvement of Chest Radiography," R. B. Wilscy, M.A., Rochester, N. Y.

6. Motion Picture Demonstrating Manufacturing of X-ray Film, L. A. Carlson, St. Paul.

7. "The American Registry of Radiological Technicians," George M. Landau, M.D., Chicago.

Address: "The Value of Ventriclelography and Encephalography to the Brain Surgeon," Alfred W. Adson, M.D., Rochester, Minn.

LEO G. RIGLER, M.D.,
Secretary.

BOOK NOTICE

THE MEDICAL CLINICS OF NORTH AMERICA, May, 1933.
Vol. 16, No. 6. Philadelphia and London, W. B. Saunders Co., 1933.

This volume is the contribution of the Mayo Clinic, and, as usual, contains many very interesting papers.

The first article, Diabetic Acidosis and Coma, presents the subject in a very clear and direct manner. Definite ideas as to diagnosis and treatment are given, and would be helpful to anyone presented with such a case. Postural hypotension with case report, is discussed by N. W. Baker. Treatment of this condition with ephedrine and ergotamine tartrate apparently is very useful. An interesting differentiation between perinephritic and paranephritic abscess is the paper of John M. Burton. P. W. Brown presents the subject of colitis and states that the term colitis should be reserved solely for conditions in which there is demonstrable inflammation of the colon. H. R. Hartman discusses the neurogenic factors in peptic ulcer, and shows that the nervous system may play a dominant part in the etiology of ulcer.

A splendid review of gout and its treatment is presented by P. S. Hench, and serves to refresh one's memory very well. Symptoms and pathology of thallium poisoning is a fine article and a very good review of a subject about which we have had numerous reports from time to time. Pathology is outlined in detail and the symptoms are well discussed. A paper on pruritus of jaundiced patients gives some good observations on the palliative treatment of a distressing symptom. Calomel, sodium thiosulphate, and ergotamine tartrate are the three drugs which give the most relief. An interesting discussion of the association of diseases is given by Dr. D. T. Wilbur, showing how diseases often occur together, while others never seem to occur. The volume is closed with a paper by Dr. F. A. Willius on the progression of myocardial disease with a record of serial electrocardiographs.

The volume is well worth reading and is recommended to all.

A. E. CARDLE, M.D.

FUNCTIONAL DISTURBANCES OF THE HEART, Harlow Brooks, M.D. J. B. Lippincott Co., Philadelphia and London.

It is very important for both layman and physician to recognize fully that many cardiac symptoms and signs, though of very striking and annoying character, are not in themselves or in their effect dangerous to life.

This book presents these conditions in such a light that they may be clearly recognized and fully differentiated from those diseases which are based on actual pathology in the heart or its adjacent structure. It covers especially those conditions with which the average practitioner comes in frequent and usually tantalizing contact.

The author has presented the subject in a clear and concise manner and the book should be read by every physician interested in the subject of heart disease and its various manifestations.

THOMAS ZISKIN, 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. James J. Morrow of Austin, was recently married to Miss Ruth A. Sargent of Red Wing, Minn.

Plans have been drawn for a new hospital at Virginia, Minn., to cost, when complete, about \$100,000.

After several years absence, Dr. D. Townsend will return from Wisconsin and resume active practice at Brooten, Minn.

Dr. Herman Bohl, a practising physician at Clear Lake, S. D., during the past ten years, died recently at a hospital in Sioux Falls.

Dr. H. R. Hummer, who has recently opened offices at Sioux Falls, will confine his practice strictly to mental and nervous diseases.

Dr. Bertha Brainard has recently opened offices for general practice at Jamestown, N. D. The Doctor is a graduate of the Rush Medical College, Chicago.

Dr. William Stafne, has returned to the Fargo Clinic, after an absence of three years at Rochester, Minn. Dr. Stafne is a graduate of the University of Minnesota.

The Mower County Medical Society opened their fall meeting at Austin, Minn., with a large attendance of members and visitors, with a particular interesting program.

Mrs. Maude Mellish Wilson, for many years editor for the Mayo Clinic and author of a textbook on medical writing, died at the Mayo Clinic, Monday, November 6, after a long illness.

Dr. J. A. Myers, professor of preventive medicine at the University of Minnesota was a guest speaker before the members of the Academy of Medicine at Columbus, Ohio, last month.

Dr. Tobias Birnberg, St. Paul, was the principal speaker at the November meeting of the District Medical Society at Sioux Falls, his subject being, "The Medical Situation in Russia."

The members of the Stearns-Benton Medical Society were guests of Dr. Herman Koop at Cold Springs, Minn., last month. After a chicken

dinner had been served, technical matters were discussed at a round table session.

Dr. David Graham, who had been in active practice at West Duluth for over 40 years, died on November 11th, after a lingering illness of many months. Dr. Graham was a graduate of the Detroit, Mich., College of Medicine.

Dr. C. P. Dolan, a veteran practitioner at Worthington, Minn., was the honor guest at the November meeting of the Southwestern Minnesota Medical Society. Dr. C. L. Sherman, Luverne, was in charge of the banquet and program.

Dr. R. C. Webb, Minneapolis, chief surgeon of the Great Northern Railway, was the guest speaker at the last meeting of the Grand Forks Medical Society. The doctor gave an interesting address on "Emergency Treatment of Fractures of the Long Bones."

At the annual meeting of the Southwestern Minnesota Medical Society held at Worthington last month, the following officers for the coming year were elected. Dr. H. DeBoer, Edgerton, president; Dr. Wm. H. Halloran, Jackson, vice-president, and Dr. E. G. McKeown, Pipestone, secretary.

Dr. John A. Pratt, Minneapolis, was the guest speaker before the Dallas, Texas, Academy of Ophthalmology and Oto-Laryngology. Dr. Pratt gave a dry clinic in the afternoon of the meeting and in the evening delivered two papers, "Re-valuation of Intranasal Surgery" and "The Endocrines in Oto-Laryngology."

Dr. Morris Fishbein, editor of the American Medical Journal; Dr. Stuart Pritchard, Battle Creek, Mich., president of the National Tuberculosis Association, and Charles H. Mayo, Rochester, president of the Minnesota Public Health Association, were the principal speakers at the meeting of many of the tuberculosis associations of the Twin Cities on November 24th.

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.) 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 December will be as follows: December 6th, "Tuberculin Testing"; December 13th, "Hand Infections"; December 20th, "Sanitary Achievements," and December 27th, "Heredity and Cancer."



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LITERATURE AND TRIAL SUPPLY ON REQUEST.

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ADVERTISERS' ANNOUNCEMENTS



SQUIBB'S NEW YORK SIGN

Broadway, Seventh Avenue, Forty-seventh Street: together they make the very center of Times Square, which is in its turn the center of the life of Manhattan Island, at least that part of its life which starts with the rise of a multitude of curtains at 8:40 P. M. and ends hours later at a hundred night clubs where Main Streeter and Broadwayite gather to while away all that's left of the wee small hours.

At this famous intersection, E. R. Squibb and Sons have erected a monster sign, perhaps the largest sign in the world, that is viewed day and night by all the vast crowds of people of which the square is never emptied.

As the above picture shows, the sign represents a sun shining down upon a skyscraper city, a village, and a

stretch of blue water which separates the two. The sun bears the familiar Squibb trademark and the whole display rests upon this slogan in giant letters: Squibb Dental Cream for Teeth and Gums.

The sign needed 8,893 man hours in construction and requires, when fully lighted, 10,000 bulbs for illumination. Some 99,000 feet of wire are needed to keep the sign functioning.

Observers note the NRA slogan at the lower right of the sun. It is no empty boast on the part of the sign itself for two men are always at work keeping it in good order and inspecting it in every detail to see that it functions perfectly.

CHRISTMAS BOX

The Curdolac Food Company believes that the diabetics of America are entitled to enjoy the holiday season even though every physician is compelled to advise, "No sugar."

For ten years an attractive Christmas Box of palatable cakes and cookies (prepared without sugar) has added pleasure to diabetics, their families and advising physicians. A food value list of contents of Curdolac Christmas Box for 1933 will be sent to any interested physician. Box 299, Waukesha, Wisconsin.

WHAT EVERY WOMAN DOESN'T KNOW

What Every Woman Doesn't Know is that psychology is more important than flavoring in persuading children to take cod liver oil. Some mothers fail to realize, so great is their own distaste for cod liver oil, that most babies will not only take the oil if properly given but will actually enjoy it. Proof of this is seen in orphanages and pediatric hospitals where cod liver oil

is administered as a food in a matter of fact manner, with the result that refusals are rarely encountered.

The mother who wrinkles her nose and "makes a face" of disgust as she measures out cod liver oil is almost certain to set the pattern for similar behavior on the part of her baby.

Most babies can be taught to take the pure oil if, as Eliot points out, the mother looks on it with favor and no unpleasant associations are attached to it. If the mother herself takes some of the oil, the child is further encouraged.

The dose of cod liver oil may be followed by orange juice, but if administered at an early age, usually no vehicle is required. The oil should not be mixed with the milk or the cereal feeding unless allowance is made for the oil which clings to the bottle or the bowl.

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(To Be Continued)

In our issue for November 1st, in describing the innovations in the new American Sterilizers, distributed in this territory by Brown & Day, Inc., of St. Paul, Minn., we inadvertently left out some vital information having to do with an important advance in filtering.

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Filter stones cannot be sterilized, and even a casual examination of one taken out of a sterilizer will quickly show how much filth is imbedded in its pores. Unsterilized air taken from the top of the sterilizer has also been a source of contamination. But with the new American filtering system both of these points of danger have been overcome. Each tank now has an individual filter *which can be sterilized* and through which air is drawn to replace the sterile water drawn off, and to break the vacuum created by the rapid cooling of the water in the cold tank. Furthermore, with this new system, raw water from leaking valves cannot possibly enter the sterile water tanks.

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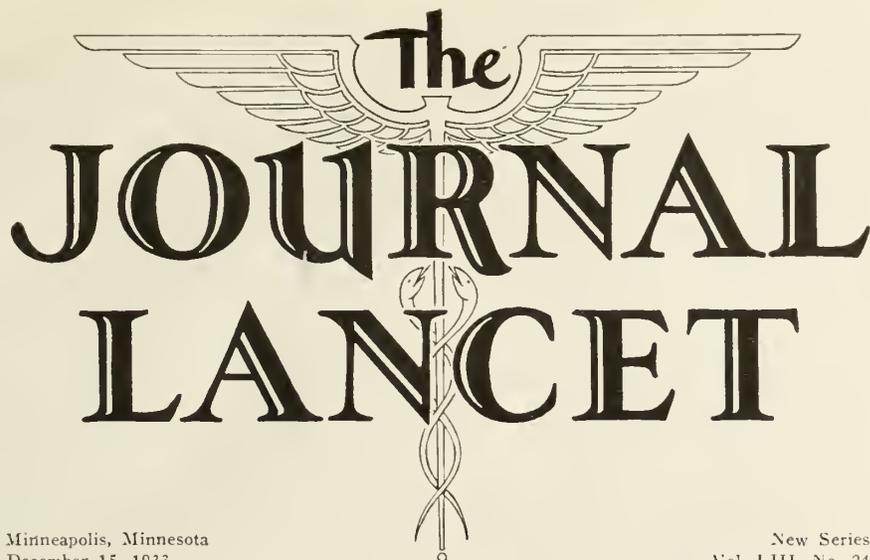
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Coronary Thrombosis*

Alono E. Pierce, M.D.
Minot, N. D.

THE profession at large has been rather slow in familiarizing itself with the clinical picture of coronary thrombosis. This fact is due partially to its confusion with angina pectoris, partially to its comparative infrequency in any one physician's private practice and partially to inappreciation of the symptoms and findings commonly presented.

The syndrome of cardiac pain induced by effort has been universally recognized since Heberden's remarkable description of it in 1768. The typical picture of a dynamic individual who hurries to lunch, bolts his food, rushes to an appointment for which he is already late and is stricken by a severe gripping pain over his heart which makes him stop and rest a few minutes until it disappears is too familiar to elaborate further. With few exceptions some form of effort coupled with excess of emotion, excitement or eating are the producing factors and rest is the relieving agent. The exact circumstances may vary but these basic factors persist. We accept this situation as angina pectoris and recognize it as the same "painful affliction of the breast" it was a hundred and sixty-five years ago. Unfortunately, until only twenty years ago we were not particular in separating out other painful afflictions which simulated angina pectoris but which represented a distinct pathological entity. Pathologists long recog-

nized that many individuals who died suddenly, or after a particularly long attack of angina had a thrombus in a coronary artery or one of its branches. In retrospect it is remarkable that clinicians delayed so long in attaching nothing more than pathological interest to these findings. In isolated instances such as those of Hammer in 1878¹ and Dock in 1896 cases of coronary occlusion were reported in which the diagnosis had been established in life and was proved at autopsy. However, there was no widespread interest evidenced until after the publication of Herrick's paper in 1912.² His description of the clinical features of sudden coronary obstruction marked the beginning of a new study, and what had been considered a pathological curiosity became a recognizable clinical disease.

The phenomena following sudden coronary occlusion depend largely upon the anatomical nature of the coronary vascular tree. While it is now appreciated that these vessels are not end arteries in the strict sense, nevertheless anastomoses between the various branches are so inadequate in an emergency that, physiologically, an end artery state is produced. In slowly developing sclerosis a single coronary artery may be gradually occluded with the production of few if any symptoms. Anastomoses from another branch hypertrophy and supply the area of heart muscle deprived of its normal circulation. Indeed,

*Read at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1, 1933.

both coronary arteries may be slowly occluded either by atheromatous changes within themselves or mesaortitis at their aortic ostia with symptoms only of lessened cardiac reserve. In this event the myocardium derives its nourishment from the Thebesian vessels which have slowly hypertrophied as the coronary system became increasingly inadequate. Time is the necessary factor for these eventualities to obtain without producing symptoms of acute infarction. However, when occlusion of a coronary artery occurs suddenly the poorly developed anastomotic vessels are unable to assume the function of a large branch and a true infarction results.

That coronary thrombosis is a disease predominate in males cannot be doubted. About five cases occur in men to every one in women. It is not a disease of advanced years as nearly three-quarters of the cases have their first attack before the sixty-first year. Conner³ points out that in 287 cases he studied "the incidence was distinctly greater in the 41 to 45 year period than in either of the five year periods in the decade between 60 and 70, and that the percentage of cases having their onset in the 36 to 40 year period was considerably greater than that having their onset between 71 and 75." He found further "that no less than one-third of all the patients had their first attack before the fifty-first year."

The heredity factor has been emphasized by Coombs,⁴ White,⁵ Musser⁶ and others. Families have been studied in which several members have died of angina or coronary thrombosis.

Contrary to widespread belief hypertension is not the principal predisposing factor to either coronary artery disease or thrombosis. Many men have been impressed by the frequency with which occlusion occurs in individuals whose blood pressures not only are low but which also have failed to show the tendency to moderate increase as their age increases. Of 500 cases of angina and thrombosis studied by White⁷ only 36 per cent were known to have had hypertension prior to occlusion. This coincides closely with the figure of 34 per cent of 274 cases cited by Conner,⁸ and 40 per cent of 145 cases reported by Levine.⁹

Atheromatous changes in the coronary vessels with narrowing of the lumina are almost constantly present in sudden coronary closure. It is quite probable that slowing of the coronary circulation is another factor contributing to the formation of the thrombus.¹⁰ Experimental work¹¹ has shown that coronary blood flow is determined chiefly by the mean level of arterial pressure, the amount of systolic output and the degree of vagus

stimulation. In other words, any circumstance which decreases the blood pressure and particularly the diastolic pressure, or lessens the systolic output, or induces coronary constriction may contribute toward coronary thrombosis. The clinical application of these facts may be seen in the circumstances usually attending the onset of thrombosis as contrasted with those of angina pectoris. Almost invariably there is an absence of effort at the onset of coronary occlusion although there may have been some unusual strain preceding the beginning of the attack. Most case records will show symptoms beginning "while sitting in a chair reading," "just after going to bed," or "asleep in the early hours of the morning." Grollman¹² has shown that the latter is a time when the diastolic pressure is lowest and the systolic output is smallest. Other cases thrombose soon after eating at which time vagus stimulation may presumably diminish coronary flow by vasoconstriction. Still other cases thrombose in the later stages of heart failure when systolic output becomes greatly diminished.

In general there are four clinical groups of coronary thromboses. The first is that of sudden death. Most individuals who drop dead have either a fatal angina or a thrombosis. Many of these people have never before had occasion to doubt the integrity of their hearts. One of our cases, a man of 39, who considered himself in perfect health, returned home from an hour's skating with his daughter, ate a light lunch, read for a few minutes, arose and pitched forward dead. Autopsy showed a zone of sclerosis 4 mm. in length near the origin of the anterior descending branch of the left coronary artery which had narrowed the lumen to a diameter of two millimeters. A fresh thrombus entirely obstructed the vessel in this area. The remainder of the coronary artery system, the aorta, and the visceral arteries showed no sclerosis. This case exemplifies the not unusual sequence of exertion, eating, rest and thrombosis.

The second group consists of cases of large infarctions which survive the initial shock only to die within a few weeks or months of heart failure or complications. Constant invalidism with its attendant suffering exists from the onset of thrombosis to death.

The third group numbers those whose heart muscles have been a little less damaged, and who, with proper supervision, may recover a good deal of their usefulness and live several years by keeping well within the limits of their cardiac reserve. The typical clinical picture of these latter two

groups embodies some features of the anginal syndrome but also presents several notable additions both of symptoms and physical findings. As previously pointed out the pain usually has its onset during a period of inactivity. It is extremely severe and is variously described by patients as "gripping," "tearing," "boring," "constricting" or "sharp and takes my breath away." It is constant and may persist for hours or even several days. Favorite locations are over the heart itself, behind the sternum, or in the epigastrium. Sometimes the pain referred to the left arm, or up into the neck or shoulder is so intense that the original cardiac pain is obscured. One of our cases suffered such intense pain in the arm that his wife sat up all night rubbing liniment into it and at no time did the patient suspect his heart as the affected organ. Another diabetic woman complained only of laryngeal pain combined with spasms of the glottis and difficulty in swallowing. If the pain is predominately epigastric erroneous diagnoses of gall stone colic, perforated ulcer, intestinal obstruction, "acute indigestion" or "ptomaine poisoning" may lead to inappropriate medical treatment or more tragically to surgical intervention. Distention of the abdomen with belching, nausea and vomiting may strengthen the impression of a disorder below the diaphragm. During the pain period the patient is frequently restless, tosses about in bed or even paces the floor. Large doses of morphine give little relief and nitrates are of no benefit. The patient's face is ashen and anxious, he sweats and has all the appearances of shock. The pulse becomes rapid and feeble, and an arrhythmia may be present. Soon after the onset the blood pressure begins to fall, the temperature rises to 100 or more, and a moderate leukocytosis appears. Temperature elevation persists for several days to a week depending upon the severity of the infarction. Within the first twenty-four hours there may be heard a pericardial friction rub which is of extreme diagnostic importance when present. It is heard usually near the apex, may be limited to a small area and frequently is present for only a few hours. It is produced by a chemical or so-called sterile inflammation of the epicardium by irritating products of protein destruction liberated in the infarcted area.

By the end of 24 or 48 hours pain and shock symptoms have usually disappeared, but prostration persists and early signs of heart failure such as moist rales in the lung bases, liver enlargement, or orthopnoea may be observed. The fate of the patient from this point on depends upon the

amount of heart muscle destroyed, the condition of the remaining myocardium, and the possibility of fatal complications. If a small branch has been occluded with the loss of only a small area of muscle the integrity of the heart will not be much impaired. If, however, the thrombus is so situated as to infarct a large portion of myocardium progressive heart failure is the inevitable sequel.

The fourth clinical group should concern us a good deal since it includes infarctions which are compatible with subsequent long life. Many of these cases are overlooked either because of the paucity or short duration of symptoms. A comparatively brief attack of cardiac pain may be considered as angina unless one is careful to note temperature elevation, leukocytosis, pulse changes, or the onset of arrhythmia. Any attack of precordial distress followed by transient or persistent alteration of the normal heart rhythm must call to mind the possibility of thrombosis however mild or of however short duration it may be. Progressive changes in the electrocardiogram are of invaluable aid in establishing the diagnosis in such cases, but even without this facility one may be reasonably certain of the situation. Medical literature becomes increasingly replete with examples of useful long life following sizeable thromboses.¹³ While second, third and more occlusions do occur in a high percentage of cases which survive the first attack nevertheless that fact should not prevent an optimistic viewpoint in the individual case. Cardiac invalidism and not death is the worst possible eventuality, and comparative restitution is frequent enough to warrant a hopeful attitude in all but the severest cases.

Complications pursuant to coronary thrombosis are often of more danger to the patient than the original accident. Disturbances in heart rhythm emanate both from increased irritability of the myocardium and from interferences in the conduction system. Multiple extra systoles and auricular fibrillation are common sequelae which impair the heart's function if the rate is greatly increased thereby. Various stages of block, auricular flutter, and paroxysms of tachycardia are also encountered. More rarely an attack of ventricular fibrillation is the cause of death. In some cases mural thrombi form within the heart chambers, especially in the apex of the left ventricle when the anterior branch of the left coronary artery is obstructed, parts of which are dislodged into the general circulation causing distant embolisms. An infrequent occurrence is rupture of the myocardium in the area of myomalacia with tamponading of the heart by hemopericardium. This

complication is delayed usually until after the first week or two and comes at a time when the patient apparently is making a satisfactory recovery.

Because of all these factors which may interfere with recovery prognosis must always be guarded. As a general rule the prognosis is better in young individuals and in those having their first attack. In Conner's¹⁴ 287 cases the mortality rate was higher in those whose initial symptoms were extremely severe, and in those who had antecedent angina or other circulatory symptoms. The immediate mortality of his cases suffering their first attack was only 16.2 per cent, and of those who recovered 56 per cent were living at the end of two years, 21 per cent at five years and 3.4 per cent at ten years. The mortality of all cases irrespective of the number of attacks is variously estimated between 25 and 45 per cent. If, then, we assume that fifty-five out of every hundred cases of coronary thrombosis have a reasonable chance of recovery and restitution we should not let ourselves adopt a fatalistic attitude toward this disease.

The most important feature of treatment is the timely recognition of the disorder. Institution of absolute bed rest for a prolonged period is always indicated. In these times of economic stress it is often easier to advise than to have the advice followed, but co-operation is usually to be had when full details of the disease are explained to the patient. He then becomes as interested in his own disease as an intelligent tuberculous patient does in his, and he develops a sense of responsibility which stands him in good stead during the rest of his life. It is to be remembered that a myocardial infarct requires considerably longer to heal than temperature, pulse and leukocyte estimations indicate. Perhaps the erythrocyte sedimentation test will be used more in the future as an index of the systemic reaction to the necrotic absorptive process.¹⁵ In any event a patient with moderately severe thrombosis should be kept at rest at least six weeks and preferably longer. When the time comes for him to get up it should be accomplished very gradually. Increasing moderate exercise in subsequent months goes far towards re-establishing a sufficient cardiac reserve. The management of the various heart complications is too large a subject to be considered in this paper. If the physician recognizes coronary thrombosis, guides the patient through his periods of rest and restitution, and supervises thereafter the activities of his daily life he will have fulfilled his function admirably.

DISCUSSION

DR. J. O. ARNSON, Bismarck: I agree with the essayist and will limit my remarks in discussing this paper to supplementing some phases of the subject that it was impossible to cover in a brief paper. I have brought some electrocardiograms to show you, inasmuch as Dr. Pierce mentioned the fact that the progressive changes in the electrocardiograms are sometimes an invaluable aid. Despite the fact that coronary thrombosis is often easily recognizable, when you have large tremors, nevertheless there are many cases that baffle ordinary diagnostic procedures.

I will show you a normal electrocardiogram, especially as it relates to the St interval and the T waves. The most interesting changes in coronary thrombosis take place in the St interval. As Dr. Pierce stated, a great many of these patients show no physical signs and apparently their hearts are normal. The electrocardiograms sometimes give no information, but there is one type that is always associated with coronary thrombosis and with intraventricular block.

(Presenting electrocardiograms). This is an electrocardiogram of a frank case of coronary thrombosis taken about three hours after an acute attack. The importance of this is the comparison showing the progressive change that took place in ten days. This one taken ten days later shows the impairment of the ventricle well. This, also taken during an acute attack, shows the changes that occur and the high control, the high take-off of the T wave and St interval. In two weeks this electrocardiogram was obtained (slide) and shows the negativity of the T wave from the high take-off. This patient left the hospital and we could not get another electrocardiogram but if we take one some time later we will probably find a marked negativity of the T waves.

(Slide). This one is shown because it is a little different than the preceding one, because of the fact of the high third lead being up in the second and possibly a little depression in the St wave. This is thought to be a possible coronary thrombosis of the right coronary artery.

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(Continued on Page 672)

Treatment of Lobar Pneumonia*

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IN THE SEASON of increased frequency of lobar pneumonia, re-evaluation of its treatment challenges the physician who is unwilling that any therapy of proven worth be denied the patient. Especially is attention focused upon specific immune therapy reports which have entered definitely into the medical literature of the last decade.

It would indeed be presumptuous to draw conclusions concerning such therapy in any individual practice unless the conditions of controlled scientific experimentation exist which by and large do not obtain. The difficulty in measuring treatment is also increased by the variation in the severity of lobar pneumonia with time and place. Lobar pneumonia in country practice in North Dakota from 1910 to 1921 was considered by Dr. H. D. Lees,¹ a careful and qualified observer, to be a relatively benign disease with a low mortality rate. This is a different story from the mortality rate of 45 per cent in type II lobar pneumonia in New York City reported by Cecil and Plummer.² In Pennsylvania, Maclachlan and Kenney³ estimate that the mortality rates vary at least 30 per cent from the highest to the lowest when urban and rural communities are compared. Standing somewhat between the lowest rural and the highest urban death rates is the report of Warr and Alperin⁴ in Memphis where the average mortality rate in 2,039 cases without specific treatment was 27.1 per cent.

In certain large hospital services, particularly in large eastern cities, controlled experimentation with specific immune sera has been carried out. Cecil and Plummer⁵ in New York City treated 239 type I cases, with a death rate of 20.1 per cent, while 234 alternate controls showed a death rate of 31.2 per cent and in cases treated within seventy-two hours of onset of symptoms there was a further reduction to 11.7 per cent in 103 cases, while 97 alternate controls had a mortality rate of 26.8 per cent. They conclude that type I serum is no longer experimental and that when administered early and in adequate dosage the clinical results are striking. In their experience, Felton's concentrated serum has higher potency and is less frequently followed by chills, serum

reactions, and serum disease than other sera or antibody solutions used. In type II lobar pneumonia, 252 cases treated with Felton's concentrated type II serum had a mortality rate of 40.5 per cent as compared with 45.8 per cent in alternate controls. While this is considered to be a favorable report for type I, the results are not at all impressive in type II. No serum is available for type III. The heterogenous group IV has been classified into 30 other types of pneumococci, and, according to Bullova⁶, specific sera in types VII and VIII are effective; such serum is not available.

It would seem that at the present time type I lobar pneumonia only has specific treatment which requires therapeutic consideration in practice. The question then arises of the incidence of type I lobar pneumonia. Cecil and Plummer⁷ in 4,310 cases of pneumococcic pneumonia found that 32.1 per cent were type I, 23 per cent were type II, 11.1 per cent type III and group IV, 33.8 per cent. In other words, in one-third of the cases of lobar pneumonia the use of serum is of reported value.[†] Moreover, the distribution of type I is chiefly in active adult life, the period of greatest contact with infection. Children very infrequently have type I lobar pneumonia, and individuals beyond the fifth decade less often have type I than younger adults.

If the impression of benefit is accepted, as it is by certain observers of broad clinical experience, such as Cecil⁸, Gordon⁹, and Lambert¹⁰, the question of procedure arises. Typing by mouse inoculation, which in itself requires a minimum of eight hours and often takes the best part of twenty-four hours, with not infrequently failure of determination, is available only in a minority of cases. In addition, the necessity of early administration, within 72 hours if best results are to be anticipated, must be stressed.*

When unable to determine the type of pneumococcus, the physician may fall back upon the probability of the individual case being type I. The examination must first establish lobar and

[†]This proportion of cases should be increased to over one-half to include type II according to a recent report by Finland and Sutliff (*J. A. M. A.*, 100: 561, Feb. 25, 1933), who noted definite benefit in type II pneumonia. This would suggest the use of bivalent type I and II serum.

*A more rapid method, without the use of animals, is available in certain laboratories.

*Presented before the Scott and Carver County Medical Society, October 10, 1933.

not broncho-pneumonia. Here the best diagnostic acumen has its limitations. While some observers may claim to be able to differentiate clinically types of pneumococcus pneumonia from each other, the occasional autopsy finding as mentioned by Bell¹¹ that in an individual case one lung may show typical lobar and the other typical broncho-pneumonia should emphasize the difficulty of dogmatic statements as to causative organisms and the type of lesions they may produce.

In the instance of a diagnosis of lobar pneumonia, the patient, if an adult and not beyond the fifth decade, apparently has about thirty-three chances in one hundred of having type I pneumococcus infection with the possibility of benefit from type I serum. Its use if attempted should be early and adequate, at least 20,000 units of Felton's type I or type I and II combined should be used intravenously and repeated as necessary in 6 to 8 hours until favorable reaction is obtained or until no value may be anticipated by its continuance. If typing has been available, the finding of another type may indicate discontinuance. Before use the intradermal skin test with the serum should be done to determine sensitization.

It might be mentioned with regard to vaccine treatment that Lambert¹² in New York from experience with 474 cases against 482 controls noted a mortality of 24 per cent in the vaccinated against 44 per cent in controls. He feels that where typing of the organism is not available, as is true in the large majority of instances, a mixed vaccine of pneumococcus, streptococcus, influenza bacillus, and micrococcus catarrhalis and staphylococci-coccus aureus and albus given intramuscularly every six hours while the fever lasts is of distinct value.

Consideration of the attempts at specific therapy convinces one of the importance of the careful routine management of pneumonia patients. The quest for the specific treatment, if followed injudiciously, has the unfortunate tendency in certain quarters to minimize the individual treatment of the patient. Undoubtedly, emphasis upon intelligent nursing care, obtaining relief from harassing cough, pleuritic pain and great restlessness by the judicious use of opiates, preferably codein, when necessary, the use of the oxygen tent to prevent and relieve respiratory distress and therefore give comfort to the patient, the control of tympanitis, the free use of water and fluid diets and the avoidance of meddlesome diagnostic and therapeutic procedures, all increase the patient's chances of recovery. At the present time practically none of the chemotherapeutic attempts, in the light of critical

analysis, appear to be of value. The careful observation of the patient for changes as in cyanosis, in physical signs in the chest, blood pressure and pulse ratio, temperature and leucocytosis will aid in prognosis and in meeting promptly complications such as circulatory failure and empyema. Indeed, around such careful management centers the most of that which we have to offer the pneumonia patient today.

The work of Larson,¹³ showing a common antigen within the different types of pneumococci, may lead the way to a new therapy of wider application.

In conclusion, if specific immune serum is used in the treatment of lobar pneumonia, it should be administered in view of the limited per cent of cases in which it is of value. Its use, if attempted, lessens in no way the importance of the careful routine management which undoubtedly enhances the patient's chance of recovery.

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The Ambulant Treatment of Hernia

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IN DESCRIBING the technique of the ambulant treatment of hernia, attention should be shown to all details connected with the treatment. It is absolutely necessary to have a knowledge of the fitting of trusses so as to hold the hernia reduced. Most trusses have been fitted too low, and as a result have held the hernial contents upward, but not within the abdomen.

In an indirect inguinal hernia the truss pad should fit over the internal inguinal ring, and cause sufficient pressure so that when the truss is removed there is a depression in the skin.

In a direct inguinal hernia the truss pad must fit lower, so as to fill the entire space above Hesselbach's triangle, so as to hold the contents of the hernia within the abdomen.

One type of truss will not fit every individual. A spring type of truss has given the best service to date. The Smithsonian Truss Co., of Topeka, Kansas, and the Baehr Surgical Supply Co., in Minneapolis, have been supplying most of the trusses. The trusses put out by the latter concern, make more allowance for adjustment and easier adjustment than the Smithsonian Trusses. Should there be difficulty in retaining the truss in proper position, a gauze bandage, swung underneath the groin from the pad of the truss to the pad on the back of the truss, serves to hold the truss down in place. This is very satisfactory, especially when the patient is wearing the truss both day and night. When a patient has the

feminine type of hips, an ordinary elastic type of truss is satisfactory.

The measurement is taken two cm. below the crest of the ilium, and bringing the end of the tape down to the symphysis pubis, entirely around the patient. Should a patient be overweight, it is desirable to put the patient on a reducing diet and in this way better results are obtained by the wearing of the truss. These patients must be watched regularly, and if a patient loses a great deal of weight, a truss that fits today will be an improper fitting truss in several weeks. Co-operation on the part of the patient in the wearing of his truss is absolutely essential.

The technique is not difficult when the anatomy of the parts is known. After the patient has been fitted with a truss, and this has been worn for a period of several days to several weeks so as to be certain that the truss fits the individual, and holds the hernial contents reduced, treatment can be started.

The formulas for solutions which we have been using to date are as follows:

Thuja mixture:

Phenol	50 parts
Alcohol	25 parts
Lloyds Specific Tincture of Thuja	25 parts

Allow to stand two days and then either decant or filter.

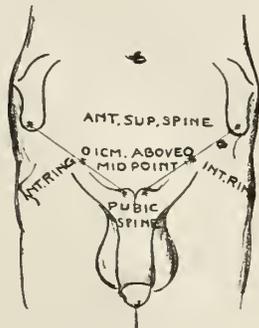


FIGURE I

Sketch shows the location of the internal inguinal ring which is approximately one cm. above the midpoint between the anterior superior spine of the ilium and the spine of the pubis. This varies according to the size of the hernia, so that in a very large inguinal hernia where the defect in the transversalis fascia is greater, the ring will extend lower. This location is above the line between the two spines and not along the line.

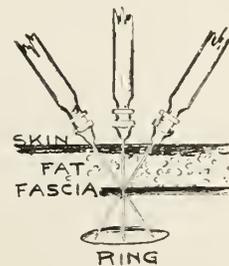


FIGURE II

Sketch shows the injection of the internal inguinal ring. The needle is introduced directly through the skin, fat and fascia of the external oblique muscle. As the needle penetrates the fascia, there is a distinct give feeling. Very little experience is needed to determine this location. As the needle is introduced slightly further, depending upon the thickness of the abdominal wall, it will approach the region of the internal inguinal ring. When the needle is in the proper location, the syringe can be rotated in a circle, thus giving free rotation of the tip of the needle. This can be very easily demonstrated by the injection of colored novocain solution, preparatory to operating upon a hernia.

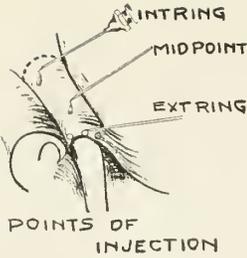


FIGURE III

Sketch shows various points for the injection along the inguinal canal. The solution should always be deposited below the fascia and not superficial to the fascia. Several points should be injected, as per sketch, at the external ring. The needle point should be within the external ring so that none of the solution filtrates into the subcutaneous fat, as when this happens, there will be a hard nodule present. The needle should not go so deep as to injure the cord.

Zinc sulphate solution :

- Zinc sulphate1 dr.
- Phenol crystals6 dr.
- Glycerin4 fl. dr.
- Aq. Cinnamomi1 fl. oz.
- Fl. extr. pinus canadensis (dark).....5 fl. dr.
- Sterilized chem. pure redistilled water..2 fl. oz.

Dissolve the zinc sulphate in the cinnamom water. Liquefy the phenol crystals by heating. Add the glycerin. Shake thoroughly until mixed and cooled; then add the distilled water and finally the fluid extract of pinus canadensis. Shake thoroughly. Allow the fluid to stand for about a week, agitating the mixture several times a day. Subsequently it should be filtered. Before injecting, boil the solution in a glass tube.

To begin with two to five drops of the Thuja mixture is injected at the internal ring as described in the sketch. Injections are made about twice a week, depending upon the reaction of the individual. Should there be much reaction then the duration of time between the injections is lengthened. After several injections in the internal ring there is usually sufficient plastic exudate so that the hernia does not come down, even when the truss is removed. After beginning treatment, the patients are advised to wear the truss day

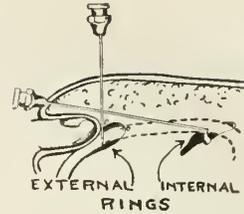


FIGURE IV

The internal ring can also be injected by introducing a three-inch needle through the external ring, and passing it forward along the inguinal canal to the region of the internal inguinal ring. After passing the external ring it is carried forward to about one and one-half to one and seven-eighths inches. There is, however, more danger of injuring the cord with this technique.

FEMORAL HERNIAS

Femoral hernias can be injected very easily by placing the tip of the finger in the femoral canal, and then injecting the solution immediately below the tip of the finger. Not over two or three drops should be injected at one time in femoral hernias. As a rule not over three or four injections are necessary to obliterate a femoral hernia.

and night for at least ten days or two weeks, or until such time that we are certain that there is sufficient plastic exudate to hold the hernia contents within the abdomen.

Injections are given at several points along the hernia canal, just beneath the fascia. Injections are also given just inside the external ring and also in Hesselbachs triangle. For the injection of Hesselbachs triangle, the needle is introduced inside of the cord and posterior to it, depositing the solution upon the conjoined tendon or the transversalis fascia.

The type of syringe most satisfactory is the ordinary insulin or tuberculin syringe with a size twenty-two gauge needle.

The thuja solution can be injected usually to a quantity of eight drops, whereas with the zinc sulphate solution two to six drops is usually sufficient. The number of injections required to close the hernia varies. A few cases have received only four treatments and had a good result. As many as twenty injections have been given to cases with large scrotal hernias. It is much better to give more treatments and be sure of a good closure.



Cancer Control in North Dakota*

Frank L. Rector, M.D.
Evanston, Ill.

MR. TOASTMASTER, Members of the North Dakota State Medical Association, Ladies and Gentlemen:

It is a great pleasure to be here this evening, although I am rather out of my own district. I am substituting for the field representative of your district, Dr. J. M. Flude, who has his headquarters in a suburb of Valley City, Hollywood, California. I am glad to be here for several reasons. One reason is that when I lived as a boy in Kansas, Dakota was still a territory and it was not an unusual thing in those days to read in the newspapers that the Federal troops and the redskins had been having another mixup with casualties on both sides.

But my greatest pleasure in being here is to talk to you about cancer. The North Dakota State Medical Association has shown its keen interest in this problem by inviting a representative of the American Society for the Control of Cancer to come here and talk for a few minutes on this problem so near to all of us.

When we speak of cancer we are not speaking of an unknown and unusual condition. Cancer is one of the oldest known diseases. It affected the earliest peoples of whom we have record. Some of the oldest fossils bear evidence of having suffered from cancer. It was well known to the ancient Greeks. Democedes, in 520 B. C., is said to have cured Atossa, wife of Darius Hystaspis, of breast cancer. Hippocrates, about 500 B. C., employed diathermy in treating cancer of the neck. At the beginning of the Christian era a great controversy was raging as to the removal of the pectoral muscles in breast cancer. So you see there is nothing new under the sun. The only additions to our therapeutic measures are the X-ray and radium.

The thing that makes cancer of special interest to the laity and profession alike is the fact that every year our vital statistics show an increase in deaths from this disease. Cancer stood sixth in the causes of death in 1900 with a rate of 63 per 100,000. In 1930 it had reached second place with a rate of 100 per 100,000. Is cancer really increasing? This is an old question, but we are not

so much interested in that question as we are in the fact that more deaths are being reported annually. Undoubtedly more cancer is being recognized and diagnosed than formerly. We know we are rapidly becoming an older population as a greater percentage of the people is living in the cancer age. More people have been saved from death in infancy and early childhood and are living in the cancer age of thirty and above. More people die of cancer today than ever before. You are confronted in North Dakota with approximately 500 deaths annually from this disease. It is estimated there are three living cases for every death. This is not such a large number when the population as a whole is considered, or when you consider many other diseases familiar to us all that often affect much larger numbers. An epidemic of influenza, for instance, will affect many thousands of people, but we do not find a high mortality in these diseases. Cancer is the most fatal of all diseases—100 per cent fatal unless it is treated early and adequately. So you are confronted with the problem in this state of preventing as far as possible these 500 annual deaths and the incapacity that accompanies the living cases.

It is interesting to know that there are approximately the same number of cancer deaths annually in a given state as there are practicing physicians. As there are three living cases for each cancer death, there are likewise about three cancer patients for each physician if equally distributed among them. From surveys made on a state-wide basis it has been found that about 2.5 per cent of the annual admissions to general hospitals are for cancer. It has also been found that approximately 25 per cent of the probable living cases are hospitalized in the course of a year. That leaves about 75 per cent for treatment elsewhere, and we do not know where or whether these cases are treated. Many superficial lesions, as skin cancers, are treated in physician's offices but many other cases must remain undiagnosed and untreated until the patient succumbs.

The economic aspects of cancer are interesting. It has often been stressed that tuberculosis is a much more serious economic problem. It is said that tuberculosis strikes down its victims in early

*Informal address at the Forty-sixth Annual Meeting of the North Dakota State Medical Association, Valley City, June 1, 1933.

life and in early adulthood; but cancer also strikes at adolescence and early mature adulthood when the individual is at the peak of his activity and capable of contributing to the welfare of the community. It is true that many old people die of cancer, but it is surprising to see how rapidly deaths mount after age thirty. It cannot be said that cancer is a disease only of old age; rather it is a disease of middle life and of the most productive age. It is estimated that it causes an economic loss of \$800,000,000 annually. So from the economic viewpoint cancer is an interesting and important disease.

A little further comparison with tuberculosis might be of interest. In 1900, tuberculosis stood first as a cause of death, but by 1930 it had dropped to sixth place in the death list. Why was this? It was due primarily to education of the profession in diagnosis and better methods of treatment; to education of the laity as to what constitutes tuberculosis and how it should be cared for. Another thing education has done for tuberculosis that I am sure it can do for cancer; it has taken the fear and mystery out of the disease. People are not particularly affected by mention of tuberculosis but when you speak of cancer a shudder will pass over many individuals. I had a striking example of this fear while attending the exhibit of our Society in the Hall of Science at the Century of Progress in Chicago. This exhibit is attracting large crowds and I think more attention is being paid to it than to many of the other exhibits in that section. Comments of visitors are very interesting. Occasionally some lady will say, "Oh, that's cancer, lets get away from here; I don't want to know anything about it!" More often people will hurry into that booth and study the display very carefully. If the present attendance keeps up for the duration of the fair at least one million people will have seen that booth and will have learned something about cancer and the value of early diagnosis and early treatment.

The American Society for the Control of Cancer has been functioning since 1914. A few years ago a survey was made of the cancer problem in the United States and, after studying that report, it was felt that probably too much emphasis had been placed on education of the public, and too little on helping the medical profession and the hospitals to learn about controlling the disease. So our major policy today is to work with the medical profession and the hospitals in developing the best possible facilities for the diagnosis and treatment of cancer. We feel they are the first

line of attack on this problem and we are concentrating our efforts as far as possible on helping the profession. Our Society also feels that the medical profession is the only group entitled to work out the control of this disease. By that I mean that it is the only group that can give the answer to the cancer patient's problem. Cancer control is a clinical problem and such help as the layman can give should be directed toward strengthening the medical profession and the hospitals in their work.

What I now say about the medical profession and the hospitals is to be taken as a general statement, for only a very few medical men in North Dakota do I know either by name or reputation. Nothing that I say is to reflect personally upon any of you. What I wish to say has been developed out of an intensive study of this problem over three years in the Middle West and I feel that it is applicable to this state as well as others, or else you are a different group than your neighbors.

Cancer is not a one-man disease. By that I mean that no one physician, regardless of his training and experience, is capable of dealing with all types of cancer with which he may come in contact. Cancer is a generic, not a specific term. Cancer of the soft palate in a new born babe is a far different disease than cancer of the lip in a man of 80 years. Cancer located in different organs and showing different histology and symptoms is not one disease. We are dealing with a group of diseases, so I say that no one physician is qualified to pass upon all types with which he may come in contact. So it has seemed to our Society and to the American College of Surgeons that the best method of treating cancer is in special centers, in hospitals where facilities are available, or can be made available for the treatment of this disease. Such institutions also offer opportunities for groups of men who, if not already competent in the diagnosis and treatment of cancer, can with experience become more competent. I think it is only a question of time before there will be developed in this country more cancer specialists who will devote all their time to this work, as many men are now doing in the fields of surgery and radiology.

The pathologist, who is a key man in the cancer diagnostic group, should be given more consideration than he now receives in many hospitals. After all, he is the man who must tell the surgeon what he is dealing with, the type and degree of malignancy, and what the various forms of therapy have to offer. The pathologist should go

into the wards and see the patients before he sees the tissues. By this means he will become more capable in his tissue interpretation and a more capable clinical diagnostician.

I feel that we are coming more and more to the idea of the group as the proper method of handling cancer patients. The hospital requirements for properly handling this disease are: A laboratory equipped and staffed to do frozen section work as well as paraffin work; deep therapy of at least 200,000 volts effective capacity, and a supply of radium up to 200 milligrams. If the radium is not owned by the hospital it may be obtained elsewhere, provided those who use it are trained in this form of therapy.

A warning regarding the use of deep therapy and radium may not be out of place. Practically all the complaints heard against radiation therapy are to the effect that it is abused, and when inquiry is made into that abuse it is found that the man who has used it has been inexperienced. So I think more and more we will find its use restricted to men who have had special training in this field. Roentgen rays and radium are probably the most highly specialized therapeutic measures we have today, and the use of these elements should be restricted to physicians who have had thorough training in this field. An institution might be equipped with the finest of deep therapy apparatus and with quantities of radium, but if there is no trained personnel to use this equipment it would be a menace to the community instead of a blessing.

Certain objectives should be kept clearly in mind when groups are formed to care for cancer patients. The first is the better treatment and better service that can be rendered these patients. The second is the use of the material seen in these clinics for educational work and for training others, such as nurses and social workers, in this problem. The third should be the utilization of the clinic material for research and study along special lines.

Just here I wish to say a word about the hospital records of cancer patients. The thing most needed in developing a cancer program is accurate records and data on cancer patients. Too often the patient's record will be inadequate as to the procedures carried out, to say nothing of follow-up notes of the patient's condition after leaving the hospital. The hospital has not discharged its full service and duty to the patient when he leaves the hospital. He should be followed up and contacted at regular intervals for at least five years, and preferably for life. When this is done regu-

larly by the majority of hospitals we will have some accurate data on our cancer patients. Too often a patient is dismissed from a hospital, his record placed in the dead file, and no further effort made to follow the case. These records should be kept in the live or active files and further information added from time to time.

Many questions will arise in your minds, I am sure, as to the practicability of this group program for cancer control. One is, who will do it? Who will be selected from the hospital staff to form the cancer group, and how? Why should these be selected and others asked to stand aside? In the selection of staff members for this service there should be no intention to discriminate. Men will be found on almost any hospital staff who are interested in cancer and who are willing to take on the added work. For a time it will be a labor of love for those undertaking it and the men who are willing to do the work are the logical ones to take hold of it, using all the interest and facilities of the other staff members that it is possible to obtain. In my experience it is the younger men who are most interested and most willing to do this work. They have seen more good results of cancer treatment, are more optimistic, and I think as with other educational movements it will be the younger men who will make the most rapid strides in developing new plans. I say this with no disrespect to the older men; they contributed in many other ways to the work and their experience and sound judgment should be utilized to the fullest extent.

I would like to say a word as to what the North Dakota State Medical Association can do to further the work in other ways. Your Association should recognize that whatever is done in this state in relation to the cancer problem should be done by and through the medical profession. The greatest problem you have to face here, as well as elsewhere, is that of interesting the whole profession in this subject. One method of bringing this matter to the attention of all the profession all the time is to have a permanent cancer committee of your Association, a minority of whose members would change annually. Such a committee can give close, careful and continued thought to this problem.

Your association might well undertake what has been undertaken by many similar organizations throughout the country, a five-year educational program among your own members. This program could be developed along intensive lines; a year being devoted to study and discussion of one phase of the problem, for instance, cancer of

the breast; another year to cancer of the uterus, and so on, until at the end of five years the body as a whole would have been pretty well studied. In this work facilities should be made available to all county and district societies for holding at least one meeting annually devoted to this special cancer subject. The state organization at its annual meeting should have a symposium on that same subject. The next year a different program with a different subject could be undertaken. In this way in the five years the entire cancer problem could have been reviewed. You should review all the newer methods of diagnosis and treatment. When these special meetings are held a lay educational program could be undertaken by the local units of the state association in which there would be news articles in local papers, radio broadcasts, talks to various clubs, and similar activities designed to reach the public. There is a wealth of opportunity in this field and of material to be used in this work. Our Society is glad to place at your disposal its printed material and helps in other ways. We have moving pictures, such as you saw this afternoon, available to medical societies simply by paying transportation costs both ways. We have charts available to those interested in the statistical side of the work.

The laity needs educating along many lines. Several widely held but erroneous ideas are in the public mind. One is that cancer is always incurable. That is a hopeless and an erroneous attitude to assume. It is being disproved every day. Statistics show that, if treated early, 40 per cent of cancers of the cervix are curable for five years or longer; that 70 per cent of cancers of the breast if seen before metastases occur are similarly curable; that 50 per cent of bladder cancer can be cured if taken early; that 80 per cent of mouth and tongue cancers respond favorably to early treatment; and that 90 per cent of skin cancers can be cured if treated before they have metastasized. We know that cancer is curable and we are justified in going before the laity and emphasizing that fact. We must get across to the people that cancer is curable.

We still find a widespread idea of social disgrace associated with cancer. People think it is a blood disease, that it has been contracted in some antisocial way, and hide it until it is too late to do much for it. This idea must also be overcome.

There are a few early symptoms of cancer that

should be known to everyone. The sore that does not heal; the lump that persists in a woman's breast; the unnatural blood-stained discharge from a natural body orifice; the change in size and color of warts or moles; the persistent indigestion with loss of weight, are all early signs that should suggest cancer to the intelligent person when one or more of them is persistently present. These signs should be known to every physician, and they should adopt the attitude of "look and see" instead of "wait and see," when patients present themselves with one or more of these symptoms. I have been told of physicians who have seen women patients two years after the menopause with a bloody discharge and have waited two more years before investigating the real cause, treating symptomatically in the meantime. I was told of a physician who encountered a frank carcinoma of the lip and referred the patient to a dentist as a case of pyorrhea of the lower lip. While not frequent, these cases occur too often and the laity is becoming too well informed about these things and about health problems in general to have them continue much longer. The medical profession must take hold of this problem and lend its support to the lay educational program or it may wake up too late to find that others less qualified but more active have taken charge of this work.

I hope the medical profession of North Dakota will ask our Society to make a survey of the state to see how cancer is being treated. I am sure we would be glad to do that for we have been doing it elsewhere and can give you help in that respect. We can give you help with literature and with ideas as to how the question is being studied and handled elsewhere.

I would also commend to you the development of a speaker's bureau within your Association through which you will give to the people of the state information on all sorts of medical problems. You have radio stations that could well be utilized for this purpose. Your newspapers, I am sure, would be glad to help in a constructive educational program for the benefit of all the residents of your state.

In closing, may we offer you the facilities of our Society for any constructive program of cancer education that you may have in mind.

I thank you for inviting me here and for listening to me so patiently.

Manifestations in Late Neurosyphilis*

Joseph C. Michael, M.D.
Minneapolis

THE manifestations in late neurosyphilis are quite logically investigated under three headings: (1) *neurologic*; (2) *psychiatric*; (3) *serologic*. At the outset it should be emphasized that we cannot do safely without any of these, neither may we be too positive of the significance of each without confirmatory collateral evidence.

Diagnosis is based on certain anatomic changes. We have recognized for some years two main types of pathological processes: (1) the interstitial, that is, involvement chiefly of the meninges, blood vessels and supportive glial tissues as contrasted to the other, (2) the parenchymatous, in which we note direct invasion of the cerebrum, cord, or nerve roots, by the spirochete.

The more comprehensive anatomic and clinical grouping is as follows: (Head and Fearn-sides)

<p><i>I Meningo-vascular</i></p> <ol style="list-style-type: none"> 1. Cerebral form 2. Hemiplegia 3. Cranial nerve type 4. Muscular atrophy 5. Lateral and combined degeneration 6. Epilepsy 	<p><i>II Parenchymatous</i></p> <ol style="list-style-type: none"> 1. Dementia Paralytica 2. Tabes 3. Muscular atrophy 4. Optic atrophy 5. Gastric crisis 6. Epilepsy
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The distribution of neurosyphilis is interesting. From January 1st this year, out of some 544 patients discharged from the Neurologic-Psychiatric Department of the Minneapolis General Hospital, 32 had neurosyphilis. The majority, 22, had paresis and taboparesis, three had uncomplicated tabes and seven meningo-vascular syphilis. A series of recent private, office and hospital cases yielded the following proportions: dementia paralytica, 15; tabes, 8; meningo-vascular, 7; cervical hypertrophic meningitis, 1; congenital, 1, and latent, 3.

It is important to determine the type of neurosyphilis because prognosis and appropriate treatment vary considerably. And it should be emphasized that this cannot be done on the basis of mere laboratory study of the blood and spinal fluid.

The practical clinician will first of all be impressed by the fact that nerve involvement varies

from a small, isolated lesion in any part of the neural system to multiple, or widespread, invasion; hence, the considerable variety of clinical pictures.

I—THE MENINGO-VASCULAR GROUP

Cerebral meningitis is most frequently basilar in location. Involvement of one or more cranial nerves takes place. Headache and vomiting occur. Sometimes there is delirium or drowsiness. Very rarely the meningitis is acute and widespread. Whereas meningeal syndromes tend usually to arise during the first few years following primary infection, acute meningitis comes on during the first six months. One case I attended began five months after the chancre disappeared.

In meningitis, mainly localized in the convexity, headache tends to be excruciating. Cranial nerve manifestations are lacking as long as spread to the base has not developed. Monoplegias or hemiplegias and aphasic symptoms occur. Serologic studies in the meningitis cases reveal strongly positive reaction. The cell count is relatively high. Isolated large gummatous formation is rare.

In predominantly *vascular* involvement we are apt to encounter sudden onset of an illness, for instance hemiplegia. The course of this in a fair percentage of cases proves to be astonishingly favorable. Aphasia and psychosis may follow extensive cerebral involvement. Pupillary changes are infrequent, and the blood, as well as the spinal fluid, present strikingly high proportion of negative reactions. Other possible signs of vascular affection are to be borne in mind. It is uncommon for these cases to develop after five years following primary infection. Hence, this, as well as the meningeal, group are found so frequently in people young in years.

Spinal cord syphilis tends to present meningeal and vascular changes in combination. Meningeal affection is indicated when we see a slowly progressing paraplegia accompanied by sensory signs, and yellowing in the spinal fluid. The frequency of sensory pictures is explained by the fact that the dorsal cord region is supplied most directly by the larger blood vessels, thus facilitating localization in that area. Transverse myelitis and thrombosis bring on symptoms quite abruptly, most

*Read before the Minneapolis Clinical Club, October 12, 1933.

often in the lower limbs. In the former, the spinal fluid reactions tend to be positive; in the latter, that is less often the case. Mental symptoms are, of course, not to be expected except when the cervical level is involved. Impaired bladder function is common.

Cervical hypertrophic meningitis is extremely rare. Southard and Solomon reported one case in a series of 2,000 neurosyphilitic patients. About two years ago I reported one such proven case (unpublished), and now I have another under my care in the General Hospital Clinic. Extremely slow progression, atrophy in both arms and sub-arachnoidal block are characteristic features.

Erb's Spastic Paralysis is probably a myelitic process localized in the lateral columns mainly, though there is a progression to other cord regions in some cases.

These two clinical forms are indeed so rarely seen that they may be regarded as clinical curiosities.

II—THE PARENCHYMATOUS GROUP

Dementia Paralytica is the most striking and best known type of neurosyphilis. It also affects the greatest number of luetic neurological patients in the late stage. Recognition of this disease in its fully developed stage is sometimes comparatively easy. This is particularly true when the psychic picture presents the well known expansive and grandiose ideas. The diagnostician should, however, not fail to recall that there is frequently a prodromal period of a year, or even longer, during which the patient has the tendency to irritability, feelings of let-down in his former vigor, loss in weight, etc. Valuable opportunities in therapy may be lost if the disease is not recognized at this period. Unfortunately, the patient is too often the last one to realize the importance of medical investigation. Besides the manic type of mental picture, we see some patients who have a melancholia without any characteristic features setting it apart; and there is the not uncommon type of simple intellectual deterioration. The paranoid reaction type is less frequently encountered. Transient confusional states occur. *Tabes* may precede the onset of dementia paralytica in twenty to thirty per cent of the patients. The higher figure was noted in our series of 22 cases during the first half of 1933 at the General Hospital. The commonest neurological signs are noted in the pupils. These are present in about 75 per cent of the cases. In the absence of *tabes*, the tendon reflexes are increased; facial tremor and speech involvement with slurring and omissions of letters or words are often evident in the

moderately advanced cases. The blood Wassermann is positive in over 95 per cent of the untreated cases, and all the four main spinal fluid reactions tend to be positive. The cell counts range below 100. However, we see too much emphasis placed upon the paretic gold curve. In practice we learn that that leads all too frequently to errors in diagnosis. It should be borne in mind that arteriosclerosis, monoxide poisoning, alcoholism, multiple sclerosis and trauma may cause the same psychiatric and neurologic signs and that syphilis, as indicated by laboratory tests, may be but coincidental. Pre-existing *tabes* should be considered in the evaluation of the neurological signs. *Dementia paralytica* causes death in most of the patients within two to three years unless appropriate treatment is instituted.

Tabes most commonly is not accompanied by psychic syndromes. Coincidental psychosis, of course, may develop and infrequently a mental picture obtains that does not signify dementia paralytica; a proliferative vascular change in the brain occasionally takes place without active inflammation or degeneration which characterizes the paretic brain. *Tabes* should be recognized in the pre-ataxic stage when pupillary anomalies, Romberg and absent Achilles reflexes are commonly present. Loss of the consensual pupillary response and diminution of muscle pain are often the earliest signs. In the uncomplicated case we look for signs of lower neurone involvement, that is atonia, hyporeflexia, deminution in acuity for perception of pain, vibratory and position sensation, all most prominent in the lower limbs. Lancing pains are characteristic in their location in the legs and lower truncal levels, and in their high incidence. Bladder and sex functions tend to impairment, along with the last named signs, in what we might term the middle stage of the disease. The great toe extension phenomenon is not looked for. As to serologic findings, the blood Wassermann is positive in about 70 per cent of the cases; in cases of over ten years' standing the figure goes down nearer to 60 per cent. The blood reaction may be positive, the spinal fluid negative, and vice versa. However, the percent of positive laboratory findings in the spinal fluid tends to be higher than in the blood. Polynuritis, radiculitis, combined sclerosis, nonluetic myelitis and sometimes cord tumor must be differentiated. Charcot joints develop quite rarely in tabetics. It seems the tabetic process in these patients is frequently arrested. In half of them the spinal fluid is negative and in three-quarters of them the

(Continued on Page 682)

Apomorphin as an Antidote to the Stimulant Effect of Scopolamin; With Case Report of Accidental Overdose*

E. A. Rovenstine, M.D.
Madison, Wis.

SCOPOLAMIN is capable of producing a satisfactory psychic sedation very difficult to obtain from the use of any other drug. The "don't care what happens" state of mind resulting from properly timed and individualized doses is particularly desirable in the preoperative preparation of patients. In our experience an occasional case of unpleasant cortical stimulation has occurred. When the supply of scopolamin used is properly prepared and not allowed to deteriorate because of long storage¹, excitement following its administration is rare. However in a large clinic where hundreds of doses of scopolamin are given each month it has been our experience to see five or six cases each year in which embarrassing excitation occurs. Two causes of excitation other than a deteriorated drug are possible. First, when pain is present and insufficient morphin has been given to control the pain, the usually desirable "don't care what happens" attitude may be transferred into a very undesirable lack of self control. Second, the patient may have an idiosyncrasy to the drug.

The treatment of these occasional cases of excitation with uncontrolled talkativeness and muscular activity was, in our hands, very unsatisfactory until Doctor Franklin Wright of Minneapolis suggested to us that a very small dose of apomorphin, one-fortieth to one-sixtieth of a grain (0.0016 to 0.0011 gm.) served to quiet such patients without causing an untoward result. We have found this suggestion of the greatest value on several occasions. No nausea or vomiting results from these small doses of apomorphin but immediate and complete arrest of the excitation takes place. It was in using apomorphine for this purpose that the mistake occurred which is described in the following case report.

A well developed, well nourished white male, age sixty, was admitted to the hospital complaining of weakness. A diagnosis of toxic adenoma of the thyroid was made and with

*From the Department of Anesthesia, University of Wisconsin Medical School.

rest and iodine therapy the patient was prepared for thyroidectomy. The thyroid gland was removed under nitrous oxid-ethylene anesthesia by the carbon dioxide absorption technique. The patient had received, hypodermically, morphin sulphate one-sixth of a grain (0.011 gm.) and scopolamin hydrobromid one one hundred and fiftieth of a grain (0.0045 gm.) two hours preoperatively and an identical dose of each drug one hour before operation. At the time anesthesia was induced, the patient's blood pressure was 140/80, pulse 80, and respiration 16. He was carried in the first plane of third stage anesthesia for seventy-five minutes with no complications or untoward reactions. At the conclusion of the operation, the blood pressure was 170/110, pulse 100, respirations 22. He was returned from the operating room awake. In a few minutes he became mildly excited and morphin sulphate one-sixth of a grain (0.011 gm.) was given hypodermically. The excitement speedily became worse requiring restraint. A staff man was called who found the patient in delirium, face flushed, a fast thready pulse and extremely rapid respirations. The reaction was thought to be from scopolamin given preoperatively, and one-fortieth of a grain (0.0016 gm.) of apomorphin was ordered as an antidote. The apomorphin preparation was available in tablets containing one-tenth of a grain (0.0065 gm.). Through an error in calculation, the patient received instead of one-fourth of a tablet or one-fortieth of a grain (0.0016 gm.), four tablets or four-tenths of a grain (0.0259 gm.) in one hypodermic dose.

In less than five minutes after the drug was administered, the patient was comatose, pulse rate fifty to sixty per minute and blood pressure had dropped from 170/90 to 130/80. He had not vomited but was making attempts to do so. Respirations were shallow and rapid. Gastric lavage was done with sodium bicarbonate solution. Caffein sodium benzoate seven and one-half grains (0.487 gm.) and one cubic centimeter of coramine were given intramus-

cularly. Despite such treatment, respirations became slower and soon ceased. An endotracheal soft rubber airway of the type used for anesthesia was inserted into the trachea through which oxygen was supplied in high concentration and mucus aspirated. Artificial respiration was accomplished first by the Schäfer method, then by means of a Drinker type mechanical respirator. After forty-five minutes of artificial respiration, voluntary respiratory movements returned. Further convalescence was uneventful and the patient was discharged from the hospital in good condition on the fifteenth post-operative day. A subsequent examination six weeks later was essentially negative.

1. Waters, Ralph M.: Toxic By-effects of the Atropin Group, *Am. J. of Surg., Anesth. Suppl.*, 36: 119-121, October, 1922.

MANIFESTATIONS IN LATE NEUROSYPHILIS

(Continued from Page 680)

blood reactions are negative for syphilis. Tabes is essentially a slowly progressing and very chronic disease process.

Muscular atrophy, in the form of a chronic anterior poliomyelitis, is not frequently observed. The preservation of sensation, the presence of fibrillary twitching and progression are classical. I have one typical case under treatment now. Atrophy also occurs in association with tabetic involvement in the lumbar and sacral cord.

Optic atrophy is first brought to our attention when the patient complains of failing vision, or when we can determine an atrophy in the fundus. It may be an isolated finding, and the primary type is seen in about seven per cent of the tabetics. Secondary optic atrophy is seen in the meningo-vascular group. Serologic findings often will not help because they are frequently negative. Muscular and optic atrophy are quite resistive to treatment.

Gastric or other type of visceral crisis may be

mainly a periodic pain attack, it may be vomiting, or both, with little or no premonitory signs. Laryngeal and rectal crises are more rare. Ocular crises are most rare; I had occasion to report the sixth case noted in the literature over 15 years ago.

Epilepsy occurs in its several forms with or without association with the well-known meningo-vascular or parenchymatous neuro-syphilitic types. The problem is to differentiate the syndrome from that caused by or associated with other agents than the spirochete. Laboratory plus neurologic study will solve this in most instances.

When we note the prominent signs for the entire group of late neurosyphilis we learn a high incidence for ocular signs, impaired patellar and Achilles reflexes, mental symptoms, Romberg, ataxia, sensory disturbances and bladder disturbances. These range in incidence per order given from 70 per cent to 30 per cent of all types. In my group of private patients, previously referred to, some eye signs were noted in 72 per cent and mental symptoms were present in 47 per cent. Epilepsy was noted in 10 per cent and visceral crisis in 12 per cent. After the second year of luetic disease, either the blood Wasserman or spinal fluid is negative in 25 per cent and more of the cases; both blood and spinal fluid are negative in 15 per cent to 20 per cent.

Subjective symptoms comprise first those of the gastric type, then lightning pains, headache, diplopia, failing vision, malaise, bladder disturbances, girdle pains, subjective ataxia, ranging in order named from 25 per cent to nine per cent of all cases.

The most difficult diagnostic problems arise when findings are negative in one or two of the three main fields of investigation. A careful interpretation of psychiatric, neurologic and serologic aspects summarizes the scope for diagnostic study.



Injection Treatment of Varicose Veins of the Abdomen

H. W. Froehlich, M.D., F.A.C.S.
Minneapolis

THE injection treatment of varicose veins of the lower extremities is now the standard form of treatment. The method of injection whether the patient lies down or stands, whether a tourniquet is used or not, and the kind of solution to use is greatly a matter of opinion of the surgeon doing the work. In our work at the Vein and Ulcer clinic of the Minneapolis General Hospital we have found that about one patient out of a hundred has dilated veins of the lower abdomen. These can be as safely treated with injection of some sclerosing solution as the veins of the lower extremities and with as good results.

ANATOMY

The veins of the abdomen that become dilated usually are one or both of the superficial epigastric, superficial circumflex iliac, or the superficial external pudendal. All of these veins are supplied with valves. The direction of the flow of blood in these veins is downward and it empties into the femoral or large saphenous vein. When the patient is in the erect position the force of the blood in the large veins of the deep circulation causes the blood to back up into the superficial veins of the abdomen and the more that the valves are destroyed the larger the veins become.

TECHNIC OF INJECTION

We believe the best solution is from one-half to one cubic centimeter of ten per cent Sodium Morrhuate given through a twenty-three gauge needle. The patient first stands and with Mecurochrome make a mark over the veins that are prominent where you will inject. This will save you a lot of time and embarrassment when the

veins are collapsed. The patient then reclines on a table so that the veins will be as empty as possible; thus the solution will come in contact with the intima of the veins in a concentrated form. If the veins are small it may be necessary to have the patient in a half sitting position so you can more easily get into the vein. After you are once in an assistant can let the patient down. After you have made your injection do not pull the needle out, but push it through the opposite wall. This will prevent the solution from oozing out the needle wound. Disconnect the needle from the syringe and go on with other injections. We give as many as six or eight injections at one sitting. We remove the needles in about five minutes and apply gauze pads strapping them on with adhesive with as much pressure as possible. The patient returns in two days when the dressings are removed. No further treatment is necessary. One month later the patient is checked over and veins that we have missed are injected.

CONTRAINDICATIONS

The only contraindications are those that would apply to the injection of the veins of the lower extremities.

CONCLUSIONS

1. Varicose veins of the abdomen are caused in the same manner as those of the lower extremities.
2. They may be safely injected with the same technic as used on the lower extremities.
3. There are very few contraindications to injecting the veins of the abdomen.





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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' Assn.
Great Northern Railway Surgeons' Assn.
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THE CHRISTMAS SEAL

The Christmas seal sale was introduced in this country in 1907 by Miss Emily P. Bissell, as a result of an article which she read concerning a seal sale in Denmark in 1904. Miss Bissell persuaded the American Red Cross to sell seals on a national basis in 1908. That year \$135,000 was raised. From 1910 to 1920 the Red Cross and the National Tuberculosis Association had a joint arrangement for the selling of seals. In 1920 the Red Cross withdrew and since that time the sale has been conducted solely by the National Tuberculosis Association and its affiliated associations. In 1930 the gross return from the seal sale was approximately \$5,500,000. This seems like a huge sum of money but it is relatively small when one considers the magnitude of the problems in need of solution. The funds from this sale have been used largely in educational programs, so much so, that it may be truly said today that there is no disease concerning which the American public knows so much as tuberculosis. For a long time no special interest was taken to keep the medical profession informed concerning the rapid advances in our knowledge of the diagnosis and treatment of this disease. However, in 1928 the early diagnosis campaign was begun and much emphasis was placed on the physician's part in tuberculosis control. This campaign has been repeated each year with the result that in 1933 more interest

in diagnosis, treatment and prevention of tuberculosis is being manifested by physicians than ever before. With this interest on the part of the practicing medical profession, one may predict many more diagnoses in physicians' offices and an eventual disappearance of free tuberculosis clinics. Moreover, there will be an increase in the number of physicians who desire to treat the lesions they detect.

The members of the Hennepin County Medical Society are deeply indebted to the Hennepin County Tuberculosis Association for providing complete equipment for the administration of tuberculin tests. Funds derived from the sale of Christmas seals were used to purchase the tuberculin syringes. Moreover, the delivering of tuberculin to the office of each physician who desires it is a service provided by Christmas seals. Such co-operation between Tuberculosis Associations and the medical profession will be productive of far greater accomplishment than when the two groups worked independently. Add to this, the present co-operation of the Health Department and the situation is ideal. The tendency throughout the nation is toward just such co-operation. Therefore, the members of the medical profession have an opportunity to contribute much to the tuberculosis control program by supporting whole-heartedly the 1933 sale of Christmas seals.

J. A. M.

AMEBIC DYSENTERY

Amebic dysentery has suddenly come into prominence through its dissemination from certain eating places in Chicago. Not only did the commissioner of health trace this to its source, but he established a precedent in so doing that will doubtless be universally adopted: the examination of food handlers in all public eating places.

Preventive measures are all the more important because of the difficulty of curing the disease after its inception. Those who had the good fortune of attending Dr. Sippy's clinical lectures at Rush will remember with admiration his diagnostic ability, when at the end of a two hours' logical dissertation, he produced the microscopes and invited all to come down and see the amebae found in the stools.

The diagnosis had been made but the cure was another matter. Dr. Tuttle, at the old Polyclinic on East Thirty-fourth street, in New York, recognizing the difficulty of affecting the entire colon by mouth or rectum, used to make an incision down to and into the vermiform appendix, and here instilling anti-amebic remedies. Ipecac and emetine have been used, but we are still waiting for a specific.

Prevention then must be our chief concern. Food handlers should be examined periodically and carriers intercepted.

A. E. H.

PHYSICIANS IN THE LEGISLATURE

The health of a community or state is a vitally important factor in the stabilization and prosperity of the nation. The responsibility of securing and maintaining this state of health falls directly upon the physicians in their respective communities; therefore, the physicians place preventive medicine above all other forms of practice and devote their time and energy unselfishly, and often at times to the exclusion of a more remunerative type of practice.

To obtain an ideal situation for this practice it is necessary to have governing laws, rules and regulations to guide the medical profession in their work. In the past the medical profession has depended largely upon the average layman who makes up the state legislature to provide a medical practice act, state board of health regulations, and the proper licensing of physicians to practice medicine and surgery.

The time has passed when the physicians should depend upon the average member of the State Legislature to provide adequate laws, rules and regulations, because the average member of the State Legislature is not entirely familiar with

that which constitutes good laws and regulations. He is usually very much confused and at a loss to know what is necessary to provide an ideal situation.

Therefore, it is necessary that physicians take more interest in legislative measures concerning these rules and regulations governing the practice of medicine. It is imperative that they become members of their respective legislative bodies by declaring themselves candidates for the legislature in the primary, and securing their election to this body in order to assist in obtaining laws that would provide for this higher type of medical practice.

E. W. J.

RELAX AND DESCEND WITH SAFETY

During the football season coaches teach their men to lessen the tenseness as they fall. Stiffening the muscles of the body is a natural reaction to the fear of being hurt but this effort at protection often makes the injury more likely or severe.

A parachute jumper was killed at the Minnesota state fair. The exact reason why his umbrella-shaped device did not open may never be known, but his teacher who observed the accident from the ground below, commented upon a noticeable rigidity that overtook him as he leaped into the air. One of the most difficult things that an aviator must learn to do is to fall with relaxed muscles making no effort with rigidly extended arms or legs to break the fall. The golfer must have a relaxed "stance" and the public speaker must be at ease before his audience. The drunk is often saved from harm because when he falls he is in a state of limp nonresistance.

A physician must learn to take financial depression like an aviator who has schooled himself to "fall with the fall," and he must teach his patients to do likewise. Nothing is gained by resisting the inevitable. Defense reactions are instinctive but "valor's best part is discretion," and when the odds are overwhelming, submission may save the complete destruction of body and mind. Fear, anxiety and worry are most destructive forces. Those who are floating about in the blue sky of financial speculation may well resign themselves to the necessity of taking the drop down to terra firma before nerves are hopelessly shattered. A relaxed and graceful descent favors a "happy landing."

A. E. H.

PROGNOSIS IN ANGINA PECTORIS AND CORONARY THROMBOSIS

The term angina pectoris covers a symptom complex, while coronary thrombosis, and the

broader and more inclusive term coronary occlusion, involves the diagnosis of a well established pathological condition. There is a definite relationship between all these, in that interference with circulation through one or more of the coronary vessels occurs in a very large proportion of the cases of anginal pain. Although the two first named may be due to a different pathological state in the vessels, exact clinical differentiation is sometimes difficult. It is also impossible in every instance to differentiate with exactitude certain of the painful incidents in coronary occlusion from the symptom complex of *angina pectoris*. A further difficulty is presented in those patients with a highly sensitive nervous mechanism in whom precordial pain develops apparently without an adequate pathological basis.

It is for these reasons that prognosis in these conditions is extremely uncertain. Patients with the anginal syndrome may go on for many years or may at any point in the progress of the malady develop a coronary thrombosis, with a much greater impairment in outlook. An individual with coronary thrombosis may die in the first moments of the attack, in the first few hours, or after two or three days in the *status anginosus*, or may die sometimes with rupture through the area of softened muscle at a period about the end of the second week after a thrombosis has occurred. On the other hand the majority of patients survive the acute incidents and many are restored to a degree of relative usefulness, sometimes for many years. The capacity of the individual heart to maintain an adequate collateral circulation is so variable that prognosis dependent on the severity of the symptoms or of the lesion may err greatly. It is because of such considerations that the statements to be given by the physician to the patient should be made with the utmost caution, and the demand or request so often made by the patient or the relatives for a time prognosis should be evaded.

Particular care in outlining prognostic considerations, however, is necessary in dealing with practically all patients with disordered hearts. There is a great tendency to look upon heart disease as of ominous significance, and the line between reassurance and over-confidence needs to be carefully drawn. The skill of the physician is often taxed to the utmost to avoid painting a picture which would be depressing to the patient and at the same time to secure co-operation for the desired program of management. Full co-operation, however, is essential, and to secure this it sometimes becomes necessary to give more

detailed information and even to leave the patient with a possible gloomier outlook than would otherwise be advisable. While the physician must protect himself against the too common imputations of ignorance when a false prognosis is given, he must at the same time be a factor in maintaining courage and the forward outlook so necessary for the continued peace of mind of his patient.

S. M. W.

VENTRICULOGRAPHY

This procedure, described in 1918 by Dandy as an accessory method of diagnosis and localization of brain tumors, has now been before the profession sufficiently long to enable us to form an estimate of its value from the standpoint of safety, for it is one of the very few purely diagnostic aids which we have at our disposal containing any element of hazard.

As originally devised by Dandy it consisted of making a trephine opening in the skull over the site of the posterior horn of one lateral ventricle, removing the fluid and injecting air through a canula. Then X-ray pictures in various positions of the head were made and the interpretations of these gave information which could not be secured in any other way. Then Frazier modified the technique by doing the trephination bi-laterally, and this, with the modifications proposed by Deery, is the method generally in vogue today. Its worth as a diagnostic accessory is conceded, as evidenced by the numerous contributions to the literature by those who have used it. If this were the whole story the present comment would be superfluous. There is another and less attractive side to the matter.

In a recent article by Riggs* the risks incident to the use of this diagnostic measure are very fully and impartially considered. Several sets of figures are given and analyzed. Thus, 392 cases of ventriculography, collected by F. C. Grant, showed a mortality of 32 (8.2 per cent); 160 cases from the clinic of Frazier gave 10 deaths (6.2 per cent). At the Neurological Institute, in a series of 148 ventriculographies, there were 12 deaths (8.1 per cent), and besides these, in this series, were 31 instances (21 per cent) wherein patients showed dangerous symptoms, followed by recovery. In a careful study of these cases, in detail, Riggs concludes that the untoward symptoms are "due chiefly to a profound disturbance of the balance of pressure conditions within the cranial cavity; and the frequency of their occurrence is not proportionate to the degree of dilatation of the ventricles or the amount of increase of

intracranial pressure." He deduces, finally, that ventriculography is a valuable and indispensable diagnostic procedure but which should be used *only in those patients in whom the localization of the tumor is impossible by clinical means or in those in whom serious doubt exists regarding the correctness of the clinical localization.*

The italics are ours and we place this emphasis on those words because we are fully in accord with them. Most writers on the subject of ventriculography, as Riggs states, "minimize the dangers and unfavorable results . . . and . . . stress the diagnostic and localizing value of the procedure." Never, under any circumstances, must it be considered appropriate for routine examinations where no reasonable amount of doubt exists.

G. C.

*Riggs, Harold W.: "The Dangers and the Mortality of Ventriculography," Bulletin of the Neurological Institute of N. Y., III, 1 and 2, 210-231 (June, 1933).

ANNOUNCEMENT

TO MEMBERS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

This is an open appeal for worthwhile contributions to the JOURNAL LANCET, on various phases of practice: medical, surgical, obstetrical, the specialties, medical economics in your area, history, and even interesting reminiscences. If anything received at headquarters should seem to be not entirely appropriate, those in charge of the selection will doubtless inform the donor, and suggest another trial.

If you will check over the issues of the JOURNAL LANCET, say from January 1, 1933, to date (November 18th), you will quickly realize, (outside of the minutes, reports, and papers of the annual meeting), how fairly few contributions are from North Dakota.

In answer to one objection sometimes brought forward, i. e., that this semi-monthly publication has not a large enough circulation to warrant contributions, one reply thereto might be that this is hardly the proper attitude to take toward what aims to represent the sister states; and, again, if an essayist sends his contributions to journals other than the ponderous weekly Journal A. M. A. (with perhaps its oversupply of manuscripts awaiting daylight), such papers are probably not available to North Dakotans, who should have had the benefit of that writing physician's experiences.

While it is true that those in active charge of collecting material for the benefit of the readers in North and South Dakota and its adjoining

areas, even to the extent of some very fine *special* issues, as well as the collecting of clinical data from the Twin Cities, etc., have been of great help, it is also clearly apparent that the North Dakotans should manifest more signs of life and of interest in the JOURNAL LANCET, by contributing their share of printed material. The papers need not be lengthy,—especially nothing like those many-paged articles and tables to be found in such research publications as the A. M. A.'s Archives of Surgery and Internal Medicine, Diseases of Children, etc.

To prove that the medics of this North Arctic Region are not the only delinquents, we quote the following Lamentations taken from the October editorial page of a Southern state—owned medical journal, with a membership of perhaps four or five-fold that of ours:

"R. I. P."

"Last January the JOURNAL inaugurated a Department of Clinical Case Reports. The two medical schools of the state, it was hoped, would supply many of these reports from their abundant material, and the staffs of other hospitals were invited to contribute. It was the editors' ambition that the series would rival the famous clinico-pathologic cases of Cabot of the Massachusetts General Hospital.

"After four cases were published, it became apparent that the editors would either have to write the reports themselves or discontinue the series. It has seemed to them wise to adopt the latter course."

Why delay your paper until that funereal time when our dignified and eloquent *Necrologist*, Dr. Grassick, has read into the annual meeting minutes a brief account of your career, and untimely demise?

A. W. SKELSEY,

Secretary, N. D. State Medical Association.

SOCIETIES

THE NORWEGIAN MEDICAL SOCIETY, OSLO, NORWAY,

celebrated its one hundredth anniversary on November the 5th, in the University Auditorium. About 250 physicians attended. Professor Peter F. Holst, president of the society, welcomed the guests and proposed a toast to King Haakon. The King gave a spirited talk, lauding the medical society for the great part it had played in the medical science, not only in Norway, but internationally as well.

Thirty-one doctors were awarded prizes ranging from \$500 to \$1,000 each. These prizes, which are awarded each year to young doctors in Norway, are made possible through the legacy of the late Doctor Malthe.

Dr. Huitfeldt addressed the Norwegian government, and Mr. Stromme, a member of the cabinet, responded. Professor Otto Lous Mohr addressed the university, and Professor Seland, rector of the university, responded, lauding the medical society for its fine work during the past 100 years.

Professor Faber conveyed greetings from the University of Copenhagen, Denmark, and Professor Forsell conveyed greetings from the universities and the medical societies of Upsala and Lund, Sweden. Professor Laache addressed the honorary members of the medical society, and Dr. Stephen Tschudi brought greetings from the medical society in Bergen, Norway.

NEWS ITEMS

Dr. J. T. Shelland, a prominent physician of Ada, Minn., passed away last month from a sudden heart attack.

Dr. A. N. Gunz, Center City, has moved his offices to Ruthton, Minn., where he will continue general practice.

Dr. W. P. Gurr, one of the first graduates of the old Minnesota Hospital College, died at Chicago last month.

Dr. H. H. Aldrich, formerly located at Eagle Butte, is now settled nicely at Lebanon, S. D., for general practice.

Dr. J. F. Crane, who was at the Mayo Clinic for several years, has opened offices for general practice at Amboy, Minn.

A new medical society has been organized at Bertha, Minn., with Dr. W. W. Will, president and Dr. V. L. Gilfford, secretary.

Dr. G. J. Bloemendaal, formerly located at Cresbard, has moved to Ipswich, S. D., where he will continue general practice.

The new hospital located at Walker, Minn., was opened for the receipt of patients this month. Dr. O. F. Ringle, is superintendent.

Dr. Hugh Cabot, Rochester, Minn., was the guest speaker this month before the members of the Academy of Medicine at Portland, Oregon.

A general appeal to citizens of Minnesota has been made by Governor Olson to contribute liberally to the obliterating of tuberculosis in the state.

A three story addition to the Deaconess Hospital at Glasgow, Mont., will be started at once, at an estimated cost of \$125,000 with capacity of sixty more beds.

Death has claimed another Grand Forks physician, who was located in that city for many years. Dr. George D. Gertson, who passed away on December 1st after a brief illness.

Dr. J. T. Shelland, who has been in active practice at Ada, Minn., for the past thirty years, died last month after a short illness. Dr. Shelland was a graduate of Rush Medical College.

Dr. T. H. Sweetser, Minneapolis, was the guest speaker at the last meeting of the Blue Earth County Medical Society held at Mankato, Minn., his subject being, "Indigent Poor."

Dr. A. H. Pohlman, former dean of the University Medical School at Vermillion, S. D., was recently married to Mrs. Helen B. Shartie of Omaha. Their future home will be at Omaha.

The Montana State Board of Medical Examiners have made application to the Federal government for a loan of \$550,000 for the construction of new and additions to old hospitals in that state.

Dr. A. D. McCannell of Minot, Dr. A. W. Skelsey of Fargo, and Dr. L. B. Green of Edgley will be the new members of the North Dakota state board of medical examiners for the year 1934.

Dr. Hartland C. Johnson, who has been in active practice for many years at St. Paul, died last month at the age of 75 years. Dr. Johnson was a graduate of the College of Physicians and Surgeons, Chicago.

Dr. M. M. Hoyt, prominent physician of Glasgow, was elected president of the newly organized Northeastern Montana Medical Association. Dr. Tarbox, Scobey, vice-president, and Dr. Jones, Wolf Point, secretary.

Dr. Louis M. Warfield, Milwaukee, was the guest speaker at the December 2nd meeting of the members of the Hennepin County Medical Society. Dr. Warfield's subject being, "Does the Heart Fail in Acute Infection."

Dr. R. C. Webb, Minneapolis, was the guest speaker at the last meeting of the Range Medical Society at Virginia, Minn. The subject of the address was "The Operative Treatment of Fractures of the Tibia Involving the Knee Joint."

The Midwest Clinic Staff were hosts to the members of the Black Hills Medical Society at Rapid City, S. D., last month. Enjoying a fine dinner, the evening was pleasantly passed in the discussion of interesting cases and business matters.

Members of the Lyon-Lincoln Medical Society held their November meeting at Marshall, Minn., with the following program being presented. Dr. F. D. Gray, "Medical Economics"; Mr. B. C. Ford, "Fractures" and Dr. E. T. Sanderson, "Obstetrics."

A Washington dispatch reports the allotment of funds for two Indian hospitals in Minnesota. One allotment was \$250,000 for the Ah-Gwah-Ching state sanatorium at Walker and the other was an allotment of \$100,000 for the General hospital at Cass Lake.

Members of the Northwest District Medical Society held their November meeting at Minot, N. D., with a large attendance. After a fine dinner being served, the "Amaebic Dysentery Disease" was discussed by Drs. Paul H. Brown, A. D. McCannel and A. L. Cameron.

At the annual meeting of the Goodhue County Medical Society recently held at Red Wing, Minn., the following officers were elected for the coming year: Dr. A. W. Jones, president; Dr. T. Vaalor, Cannon Falls, vice-president, and Dr. L. A. Steaffers, Red Wing, secretary.

The Mower County Medical Society held their annual meeting at Austin, Minn., and elected the following officers: Dr. R. S. Mitchell, Grand Meadows, president; Dr. L. G. Flanagan, Austin, vice-president; Dr. P. A. Robertson, Austin, secretary, and Dr. A. E. Henslin, LeRoy, treasurer.

Dr. C. H. Mayo, Rochester was re-elected president of the Minnesota Public Health Association, with Dr. O. E. Locken, Crookston, first vice-president; Dr. W. S. Broker, Battle Lake, second vice-president; Mrs. A. L. Sperry, Owatonna, secretary, and Dr. A. M. Calvin, St. Paul, treasurer.

The Steele County Medical Society, have named their officers for the coming year at their recent annual meeting, at Owatonna, Minn. Dr. W. C.

Roberts, president; Dr. J. F. Smersh, vice-president; Dr. D. H. Dewey, secretary, and Dr. C. L. Farabaugh, censor. All of the officers are residents of Owatonna.

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.) The program for December 20th will be "Sanitary Achievements," and December 27th, "Heredity and Cancer."

The regular meeting of the Academy of Medicine was held at the Town and Country Club, December 13, with the following program: "Practical Experiments in What Actually Constitutes a Good Clinical Record," Dr. Halbert L. Dunn, St. Paul; "The Diagnosis and Treatment of Malignant Tumors of the Thyroid Gland," Dr. Martin Nordland, Minneapolis.

Annual Registration Due During January.—All practitioners of medicine and surgery holding licenses to practice in Minnesota are required by law to be registered annually during January, with the secretary of the board of medical examiners, and at that time to pay a fee of \$2. A licentiate who practices without renewing his license is guilty of a misdemeanor and is subject to prosecution.

Seven prominent physicians were guest speakers recently at a meeting of the industrial safety school of Duluth, with the following interesting subjects being presented: Dr. S. H. Boyer, "Medical Ethics"; Dr. B. F. Davis, "Cancer and Cleanliness"; Dr. D. L. Tilderquist, "Your Eyes"; Dr. P. F. Eckman, "How Long Can We Expect to Live?"; Dr. Gage Clement, "Why the Use of X-ray?"; Dr. A. O. Swenson, "Shock and Hemorrhage," and Dr. Harry Klein, "Auto Injuries."

Court action to take away the corporate charter of the Medical Service corporation of Minneapolis has been started for the state of Minnesota. A District Judge signed a writ of quo warranto, ordering the corporation's officers to appear in court and show cause why its charter should not be forfeited to the state. The company was formed last August. An affidavit filed with the petition states that the corporation offers medical service at a flat rate of \$1.50 per person per month, and also that it has been soliciting medical business in public schools, particularly through the teachers. The state explained, is basing its action on a law which prohibits corporations from practicing medicine in Minnesota.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD
OF MEDICAL EXAMINERS, OCTOBER 28, 1933

BY EXAMINATION

(October)

Name	School	Address
Balcome, Milton Monroe	U. of Minn., M.B., 1932, M.D., 1933	2065 Commonwealth, St. Paul, Minn.
Barrett, Earl E.	U. of Minn., M.B., 1932, M.D., 1932	St. Luke's Hospital, Duluth, Minn.
Berman, Reuben	U. of Minn., M.B., 1932, M.D., 1933	C. C. 725, Orr, Minn.
Blake, Thomas W.	Johns Hopkins, M.D., 1927	Mayo Clinic, Rochester, Minn.
Boyer, Samuel Huntington, Jr.	U. of Wis., M.D., 1932	Wis. Gen. Hospital, Madison, Wis.
Dorsey, John Michael	Rush Med. Col., M.D., 1931	Mayo Clinic, Rochester, Minn.
Dullum, Dell Fred	U. of Minn., M.B., 1932, M.D., 1933	Mound, Minn.
Eaton, Lealdes McKendree	Rush Med. Col., M.D., 1932	Mayo Clinic, Rochester, Minn.
Eckman, Ralph Johan	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Ellis, Earl William	U. of Minn., M.B., 1932, M.D., 1933	Stewartville, Minn.
Fisher, Laura Maggie	Temple U., M.D., 1931	U. of Minn. Dept. of Path., Minneapolis, Minn.
Flesche, Bernard Alton	U. of Minn., M.B., 1933	Swedish Hospital, Minneapolis, Minn.
Gammell, Robert Theodore	U. of Minn., M.B., 1932	Swedish Hospital, Minneapolis, Minn.
Graves, Richard Bennett	U. of Minn., M.B., 1933	Deaconess Hospital, Minneapolis, Minn.
Grytbak, Margit Helga	U. of Minn., M.B., 1932, M.D., 1933	2200 Sargent Ave., St. Paul, Minn.
Hamilton, William Selden	Johns Hopkins, M.D., 1931	Mayo Clinic, Rochester, Minn.
Hardwick, Robert Shultz	Northwestern, M.D., 1931	Mayo Clinic, Rochester, Minn.
Helmick, Caroline Elizabeth	U. of Minn., M.B., 1932, M.D., 1933	Pokegama San., Pokegama, Minn.
Henrikson, Earl Clifford	Rush Med. Col., M.D., 1930	Mpls. Gen. Hospital, Minneapolis, Minn.
Hinshaw, Horton Corwin	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Hoffert, Henry Eberhardt	U. of Minn., M.B., 1932	916 E. 15th St., Minneapolis, Minn.
Hovland, Melvin Louis	U. of Minn., M.B., 1933	2315 S. 6th St., Minneapolis, Minn.
Koepsell, Arthur Aug. Herman	U. of Minn., M.B., 1932, M.D., 1933	372 N. Cleveland Ave., St. Paul, Minn.
Krause, Carl William	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Lundberg, Ruth Ingeborg	U. of Minn., M.B., 1932, M.D., 1933	1922 Pierce St. N. E., Minneapolis, Minn.
Maisel, John Josiah	Rush Med. Col., M.D., 1931	Mayo Clinic, Rochester, Minn.
Neary, Richard Peter	U. of Minn., M.B., 1932	4417 Zenith Ave. S., Minneapolis, Minn.
Nyquist, Roy Henning	U. of Minn., M.B., 1932, M.D., 1933	2707 Russell Ave. N., Minneapolis, Minn.
Pankratz, Peter J.	U. of Minn., M.B., 1933	Swedish Hospital, Minneapolis, Minn.
Parker, Robert Lawrence	Northwestern, M.B., 1932, M.D., 1933	Mayo Clinic, Rochester, Minn.
Payne, Royal Chester	U. of Minn., M.B., 1933	Bethesda Hospital, St. Paul, Minn.
Pogue, Richard Ewart	Col. Med. Evang., M.D., 1933	Watertown, Minn.
Potthoff, Carl John	U. of Minn., M.B., 1932	Asbury Hospital, Minneapolis, Minn.
Roberts, Wyman John	U. of Minn., M.B., 1932	Mpls. Gen. Hospital, Minneapolis, Minn.
Robertson, Helen Lucile	U. of Minn., M.B., 1932, M.D., 1933	530 5th St. S. E., Minneapolis, Minn.
Shaperman, Eva	U. of Minn., M.B., 1931, M.D., 1932	3228 22nd Ave. S., Minneapolis, Minn.
Teall, Ralph Cromwell	U. of Cal., M.D., 1932	Mayo Clinic, Rochester, Minn.
Trenouth, Stanley Mortimer	Queen's Univ., M.D., 1930	Mayo Clinic, Rochester, Minn.
Walter, Clarence William	U. of Iowa, M.D., 1932	587 Grand Ave., St. Paul, Minn.
Ward, Charles Edward	Tulane U., M.D., 1930	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Hart, Vernon Lewis	U. of Mich., M.D., 1924	820 Med. Arts Bldg., Minneapolis, Minn.
Heinz, Dorothy Clarissa Virginia	U. of Mich., M.D., 1932	Col. of St. Teresa, Winona, Minn.
Quigley, Maurice Werling	U. of Minn., M.B., 1929, M.D., 1930	Caledonia, Minn.
Schmidt, Paul G., Jr.	U. of Minn., M.B., 1931, M.D., 1932	Cottonwood, Minn.
Swanson, Paul Edgar	U. of Ill., M.D., 1932	726 3rd St. S., Virginia, Minn.

NATIONAL BOARD CREDENTIALS

Challman, Samuel Alan	U. of Minn., M.B., 1929, M.D., 1930	1800 Chicago Ave., Minneapolis, Minn.
Goldsmith, Grace A.	Tulane U., M.D., 1932	Mayo Clinic, Rochester, Minn.

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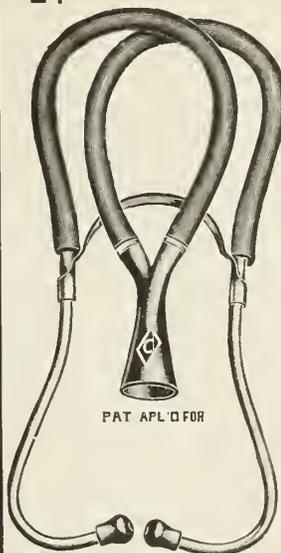
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