

of the neurotic heredity with the spirit and drug history. The more thoroughly these are known the more accurately conditions of the brain can be determined. The question is one of cause and effect; not of theory nor of legal dictum, but of actual fact, with the legal application of which the expert has no concern.

DISCUSSION.

DR. BROOKS F. BEEBE, Cincinnati, stated that many medical witnesses are not medical experts. They do not know the subject, and yet their testimony will go for as much on the witness-stand, often, as that of Dr. Crothers himself, simply because the laws have been made through ignorance and not on a scientific basis and, therefore, are altogether wrong. There is no question in the medical man's mind as to when an individual is responsible and when he is not. The line is clearly drawn, the difference being one of habit or disease. One individual goes out and takes one glass of whisky or two glasses of whisky and stops as he chooses; in the other case a man takes one glass of whisky and he can not be prevented from going on a spree. They may have an equal amount of knowledge, but not of will power. If it is simply a bad habit, the man is responsible for taking the alcohol and for all its consequences. On the other hand, if there is lessened will power, disease exists to that extent and irresponsibility follows. The method of punishment of these alcoholic criminals is all wrong. In Cincinnati the cases are tried in a police court. A man goes on a little drunk and is sent up to the workhouse for 30, 60 or 100 days. He comes out and in a very short time goes on another spree. When a police officer was asked what proportion of them returned, he said that more than two-thirds of them were sent to the workhouse more than once, many flitting from one to the other for years and years. If responsible, as some of them probably are, they should be sent to the workhouse, but doubling up the time with each new arrest, giving them 60 instead of 30 days, 120 instead of 60 days, and so on. Old offenders should spend part of their time in the workhouse being treated for their diseases—medicinally and otherwise—part of the time being spent in working for themselves and for their families, and in this way they may get back into a healthy condition. It is not a question of punishment altogether. It is a question mostly of curing the disease. Certainly an individual has no right to walk the streets and do harm; certainly the public has a right to be protected, but the state is in duty bound to take care of an individual in the proper manner. The state owes a duty to the criminal in more ways than one; to take care of him and of his children. Such people have no more right to marry and to propagate offspring than have the tuberculous or people with any other diseases, and the state should look after those cases also. Let physicians help to make laws permitting no one to marry unless he has a certificate of health and good character. The prevention of crime will be accomplished more readily by preventing propagation of the species than by punishing irresponsible diseases.

DR. S. M. CROWELL, Charlotte, N. C., said that physicians as well as the laity are too prone to look on these diseases as loathsome habits which do not need scientific consideration. The city recorder of Charlotte said that he was thinking seriously of forming a bill to be introduced in the next legislature to provide a treatment for these cases. Under its provisions, instead of sending a chronic case to work on the county roads, he would sentence him to a county sanatorium provided by the state legislature. Then, after a proper course of treatment, if the case should again appear before him for a similar offense, he would consider punishing him in some way.

DR. ALBERT E. STERNE, Indianapolis, declared that if the first law of nature is the preservation of liberty, then the punishment of the chronic alcoholic for crime is against natural law. Is not the mere fact that the person is satisfied and is willing to spend three-fourths of his life in prison *prima facie* evidence that the reason and judgment of the man is at fault? The mere fact that he goes to prison time and again and is

released only to be sent back again within twenty-four hours shows that it is not a habit and that the man is mentally unsound, that he possesses no judgment and exercises no judgment. That man is sick; he needs treatment; he needs to be incarcerated in a place where he will be treated, not where he will be surrounded by influences more deteriorating than those from which he was removed. A bill was introduced into the Indiana legislature two years ago, which was lost because the man who introduced it proposed to levy a tax on druggists selling liquor, morphin and opium without the prescription of a regular and practicing physician. Of course, the druggists got together and immediately put down that bill. Now there is another one which will come up at the next session to establish a hospital for inebriates. The city hospital is the place for the acute cases, just the same as for any other acute disease.

THE MUSEUM IN MEDICAL TEACHING.

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MONTREAL.

The stress and the high pressure of modern life is felt nowhere more keenly than in the field of higher professional education. On all sides the demand is heard for a wisely simplified curriculum, for a longer term of study, for methods that will bring the ever-widening field of knowledge to be covered within the range of the personal observation and induction of an ever-multiplying number of students. To meet the difficulties of the case, educational reforms have taken place all along the line. Teaching is becoming always more objective, illustrative, the didactic method more colloquial—so-cra-tic. The student is called on to produce, even more than to acquire, to enquire, to debate, and to himself form judgments on the facts of his own observation. The laboratory system, in short, with the symposium, is replacing the lecture room and the thesis.

Nowhere are these new methods of teaching carried further than in America, and yet it appears to me that it is on this continent that the remarkable adaptation of the medical museum to this colloquial form of objective teaching is, perhaps, least understood.

In this paper I will first present the important place which the museum should and can fill in medical teaching; and secondly, I will try to show how a well-organized, well-classified museum evolves itself as a teaching mechanism of great value; presenting also the methods in use in the pathological museum of McGill University which, although still almost in their beginnings, have proved successful in developing it along these lines.

THE MUSEUM IN MEDICAL TEACHING.

In this connection Professor Huxley has said: "Without doubt there are no helps to the study of biology, or rather to some branches of it, greater than our natural history museums; but, in order to take this place in biology they must be the museums of the future. The museums of the present do not by any means do as much for us as they ought." And again: "To all those who intend to pursue physiology, and especially to those who intend to employ the working years of their life in the practice of medicine. I say there is no training so fitted, or which may be of such important service to them, as the thorough discipline in practical biologic work which I have sketched, as being pursued in the laboratory hard by."

I have come on a most interesting article, "Museums as Educational Adjuncts to Medical Colleges," a graduating thesis by M. Josiah Roberts, which obtained hon-

orable mention in the medical department of the University of New York in 1882. This paper deals with the whole subject of the formation and functions of natural history museums, and in one section says so succinctly and so exactly what we have found true in the work in our own medical museum at McGill that I quote from it fully. Mr. Roberts says:

"How can the museum thus collected be made most useful? I would answer: Use the material thus collected as the basis for a course of museum laboratory instruction which will train young minds to do accurate observational work, thus developing the three great functions of the intellect, discrimination, agreement and retentiveness, while at the same time increasing the extent and diffusion of biologic knowledge. The true functions of our medical museums, in addition to providing for public instruction, should be to afford facilities for a course of instruction which will give medical students the opportunity to personally observe facts, and the impressions which will follow will be clear, definite, permanent, and hence far more valuable than any plagiarized information taken from books. If this kind of training, which it is so desirable that every medical student should have, can be obtained by a graded and systematic course of observational study on these forms, a knowledge of which has a direct practical bearing on the professional duties for which he is trying to fit himself, I think the evidence is *prima facie*, that the time is now ripe when at least the first tentative step should be taken toward its realization."

Mr. Jonathan Hutchinson,¹ in a descriptive sketch of his "Clinical Museum," says: "I venture to assert that I can give to anyone who will go round these rooms with me and inspect the associated series which are devoted, for example, to injuries of the head, rhinoscleroma, etc., far clearer and more definite views in the course of ten minutes than could be gained by a week's reading."

To the above quotations may be added the fruit of our own experience during the past few years in the pathological museum of McGill University. Of this I would say, and I can not speak too strongly, that, given a medical museum with a good material on its shelves and in storage, a good system of classification, and an active medical officer in charge, and the conditions are presented for a laboratory system of great scope and of remarkable efficiency. Here facts, showing the thousand gradations and variations of disease, are presented in their correlated order, or in sharper contrast, at first hand to the observation of the student. His native powers of observation, judgment and induction are at once elicited; he obtains a new understanding of what he has read of and seen elsewhere, and a keener enthusiasm for his work at the bedside. And this gain of knowledge, or insight into disease, is acquired without a strain on his memory, but rather with the mental relief which comes from seeing in their simplicity conditions the abstract ideas of which it has required often a powerful effort to carry in his mind. The organized museum is to general pathology what the autopsy room is to medicine, what dissection is to anatomy, what—to go further afield—traveling to see new countries is to the study of geography.

It is in the presentation of series of specimens in an ordered sequence that the strength of the museum system lies. Professor Virchow, writing at the opening of his own great museum in Berlin in 1901 of this teach-

ing by means of large numbers of museum specimens illustrating allied and differing pathologic conditions, expressed the object attained in these words: "Thus will the student prepare himself for the difficult art of forming for himself out of the confusing many-sidedness of pathologic appearances, a general idea of a diseased process, even in those cases in which direct observation is impossible."

THE SYSTEM IN THE PATHOLOGICAL MUSEUM OF M'GILL UNIVERSITY.

The collection of this museum was begun in 1824 when the medical faculty itself was organized. Ever since that time it has been a cherished object of the teaching staff, who have always used it largely in illustrating their didactic lectures. It thus contains a rich material, which has of late years been increased quite one-third, by the efforts made to fill in the gaps in the teaching series.

During the past few years much active work has been done in this museum. It has been carefully reclassified and recatalogued on a set of descriptive catalogue numbers, after a plan similar to that of the Dewey decimal system of classification in use in libraries. Especial care has been taken to preserve the natural colors of organs by the methods of Kaiserling and Jores, and specimens are carefully mounted on glass frames so as to preserve their anatomic relations, and to show the pathologic lesion to the greatest advantage to the student. And a curator is on duty whose especial function it is to develop the museum as a teaching organ and to fill in gaps in its teaching series by representing the specimens needed to the pathologists of the two great city hospitals, a curator who also has ample time to place at the disposal of the students.

Under these conditions the usefulness of the museum to the students has developed beyond the expectations of those engaged in the work. It has already become a self-teaching mechanism, the possibilities of which as a supplement to both clinical and post-mortem work are almost unlimited.

THE GENERAL ARRANGEMENT OF THE MUSEUM.

The museum proper now consists of a suite of four rooms communicating with the curator's office and a large lecture room used by the professor of pathology for his lectures on that subject. Of these rooms, the largest and best lighted is the one in which the majority of the moist specimens are kept. It is supplied with a number of large tables fitted with movable shelving, which are used for demonstration and exhibiton purposes, or, with the shelving removed, for the writing of descriptive exercises. Of these tables, the largest runs down the center of the room, and is fitted with a double tier of two steps so that a set of three shelves is presented on either side. This table is the one used for the routine demonstration. The others have a single tier of two steps each.

Of the other museum rooms, one is devoted to the osseous system, one to the female generative system (the obstetrical and gynecological museum), and one to the medicolegal collection.

The curator's room is fitted with abundant shelving. Here all new specimens are received, are given a consecutive entry number in the museum entry book, and are filed on the shelves, classified under organs. These curator's specimens are added from time to time to the

1. British Med. Jour., Dec. 9. 1893.

2. Virchow: Das Neue Path. Museum zu Berlin, 1901.

museum as the occasion arises or the opportunity for mounting occurs.

An end of the obstetrical museum is railed off for "hand-specimens" of the different organs. These are duplicates of specimens already in the museum, which may be removed from the jars at will by lecturer or student. The remaining museum apartments in the other parts of the building are the maceration room, the preparation room and an extra storage room in the basement.

THE CLASSIFICATION.

The museum is arranged on an anatomic classification with a pathologic subclassification. It is necessary to emphasize this particular, because, although the exact form of classification in use is not essential, it appears to me that a detailed method of some kind is absolutely necessary to the development of a true teaching museum. And the decimal system of descriptive catalogue numbers recently applied here after a plan suggested by the late Prof. Wyatt Johnston, has been so practical in its results and working that it can not be passed by, although a full account of it has already been published elsewhere.³

The museum is divided into ten sections corresponding to the ten systems of the body. Each system is subdivided into its different organs, which are placed in order under its section, the specimens arranged under each organ according to the pathologic classification, of which there are likewise ten main divisions, with subdivisions of these as in the anatomic classification. In the descriptive catalogue number the anatomic condition precedes, and the pathologic follows the decimal point, while the particular specimen is indicated by a small index figure to the right of the catalogue number. Thus if 11. represent the pericardium, and .34 fibrinous inflammation, 11.34¹ means the first specimen on the shelf of fibrinous inflammation of the pericardium.

The museum is thus divided into the following sections, each of which is labeled and numbered:

Systems.—1, the circulatory; 2, respiratory; 3, digestive; 4, glandular; 5, urogenital; 6, female generative; 7, nervous; 8, muscular and tegumentary; 9, osseous; 10, regional.

These are again subdivided as follows (each subdivision in the museum bearing the name and number of the organ belonging there):

Organs.—11, pericardium; 12, heart and myocardium; 13, endocardium; 14, arteries; 15, veins.

Twenty-one, nose; 22, larynx; 23, trachea and bronchi; 24, lung; 25, pleura.

The main divisions of the pathologic classification are: .1, anomalies; .2, circulatory disturbances; .3, inflammatory; .4, infections and parasites; .5, granulomata and general diseases; .6, progressive changes; .7, degenerations; .8, wounds and injuries; .9, specific artefacts; .0, general and supplementary.

Into the subdivisions of the pathologic classification it is unnecessary to enter here, as it is the subordinate classification in the museum and, moreover, is only detailed in those departments in which there are many varieties of a given condition, as in the inflammations of the pericardium, anomalies of the heart, etc. Nor is it adhered to strictly in order of teaching wherever convenience or clearness suggests it should be set aside; only the specimens bear their descriptive numbers and so always stand in the same order on the shelves; while, if

no circumstance give another direction to one's thought, one's mind has always a definite order to follow in the presentation of ideas.

The order of the anatomic classification, on the other hand, is strictly adhered to. It is followed exactly in the systematic demonstrations one department after another being gone over in rotation, in the order of all specimens wherever filed away, and in all notices sent out. And this is found conducive to celerity and thoroughness.

So much for the general arrangement and classification of the museum. The work done there for and among the students may be summarized under the following heads:

1. The development of teaching series.
2. The supplying of lecture rooms and clinics with illustrative material.
3. The systematic demonstrations to students.
4. The exhibitions to students and to the teaching staff.
5. Written descriptive exercises on museum specimens.

THE DEVELOPMENT OF TEACHING SERIES.

In the application of the descriptive catalogue numbers, in responding to the demands of the lecturers or clinicians for material to illustrate their didactic work, in elaborating the descriptive catalogue, and most of all in the systematic instruction of students within the museum, the curator becomes aware of the lack of specimens illustrating given pathologic conditions. From time to time a circular of information is issued to the pathologists of the city hospitals informing them of the *lacuna* in the collection.

ILLUSTRATION OF LECTURES AND CLINICS.

The lecture rooms are, of course, supplied at request, and also the clinics at the hospitals, when desired. Strong baskets are kept for this latter purpose, and borrowers' forms, "returnable in 48 hours," are signed. The very valuable specimens are, of course, not sent out in this way, but the demand can generally be met usefully, the need only being to supplement the teaching collections which are kept at the hospitals themselves.

THE TEACHING OF STUDENTS WITHIN THE MUSEUM.

All the work done in the museum, both descriptive exercises and the regular demonstrations, is entirely voluntary, a matter arranged between the curator, with the sanction and encouragement of the director of the museum, and the students, through their class president. The work has no place on the curriculum, and the only hour left free for it has been 8 a. m. The attendance and the descriptive exercises done do not raise the students' standing in any way.

These circumstances have rather helped than retarded the development of the classes. A high average attendance of the best men in the year is always to be had; the morning hour finds everyone fresh and untired.

THE MUSEUM DEMONSTRATIONS.

So far, these have been given to the fourth year only, which is divided into five groups of some twenty men each, each group coming in one morning in the week. It has been found expedient to make the groups rotate during successive weeks, as in the course of the repeated demonstrations of the same material interesting points are brought out, so that classes held at the end of the week have the advantage. Saturday morning is kept free and is used to respond to the special requests of some

3. American Medicine, April 3, 1903.

few of the students who may wish some point in the week's work reviewed.

In the demonstrations, the order of the anatomic classification is followed around the whole museum, every organ being examined in rotation until all the museum material of real interest has been shown.

The method used in showing the material is entirely descriptive, and "quizzing." The specimens are arranged in order on one side of the shelving of the long center table, and in a short introductory talk of some five minutes (during which also as much as possible is done by questions), an attempt is made to bring forward the salient points in the series to be studied. Sufficient jars are then given out to a few of the class to keep the whole group busy, and a couple of minutes is allowed for preliminary examination of the individual specimens before quizzing on one of them is begun. The group is small enough to allow all present to see the specimen under consideration, and there is room for difference of opinion and for the introduction of many other specimens for purposes of illustration and explanation of disputed points. Discussion is encouraged and a set of standard text-books is at hand for reference, and the clinical notes of the cases where these are available.

In these demonstrations, covering as they do so wide a field, the special pathology of the internal organs, the surgical pathology of bone, the diseases of the special senses, the pathology of obstetrics and gynecology, the curator does not attempt to teach the student as one especially informed along any line, but only to lead him in the study of the specimen for himself, while bringing to his notice, in the quickest possible way, all the illustrations of a given fact that the museum affords.

THE EXHIBITIONS.

At the close of the week's demonstration, the organ which has been studied by the different groups in rotation is transferred to the shelving on the other side of the table to make room for the series of the week following. There it is kept on "exhibition," with the descriptive card catalogue at hand for purposes of review by the student. As the other organs of this system are studied, they also are placed "on exhibition," the other tables with shelving being called into use when necessary. When the demonstrations on this system are completed, or at a certain point in it if the material is very extensive, a pause is made in the morning grinds. The system, or a part of it, having been meantime arranged in first-rate order by mounting the specimens used from storage to fill in gaps in the teaching series, by re-labeling, etc., is declared "on exhibition" by a notice posted to the students and by circulars issued to the members of the teaching staff.

These circulars are sent to the teaching staff to stimulate their interest and also to give them an opportunity of informing themselves of what the museum contains.

For a week or more, reviews are held on parts of the system on exhibition at the request of the students. The systematic "grinds" are then resumed.

In March, when the sessional work becomes very heavy, the regular demonstrations stop, and the opportunity is now taken for the "Annual Exhibition," when all specimens that have been mounted during the current year, having been catalogued and carded, are placed "on exhibition," for the benefit of faculty and students alike, before being placed on the shelves. Much informal demonstrating is done while this exhibition continues.

It is common also for some of the lecturers in the different departments and for some of the clinicians to re-

quest the collaboration of the curator in the illustration of their subject within the museum. The series requested is placed "on exhibition" within the museum and is either demonstrated by the lecturer himself or informally by the curator to successive groups.

STUDENTS' DESCRIPTIVE EXERCISES.

Specimens of a given condition, with three or four others, showing allied or differing conditions, are allotted to the student, to be worked out at hours of his own choosing. Museum forms are supplied having the following directions stamped in the upper left-hand corner (for which purpose a rubber stamp is kept):

Subject,; Date,; Spec. No.,; Name,; No., Describe briefly the conditions shown in the specimen, commencing by an epitomized anatomic diagnosis and then describing fully first the anatomic and then the pathologic appearances. Indicate doubtful appearances by the sign (?). On the reverse side of the sheet mention the most important allied or associated conditions not shown in the specimen. Point out the points of similarity and difference in the specimens of allied conditions allotted for comparison.

This rubber stamp was presented by the late Professor Wyatt Johnston, whose suggestion these descriptive exercises were. Although the time of the student is too limited for extensive work of this kind, each one can manage three or four of these sheets, and as an introduction to the work in the museum, familiarizing the student with the descriptive method that is attempted in all the oral work, and in making him realize the immense value that the careful study of a single diseased organ is to him, these exercises are simply invaluable. I ascribe the success of the museum demonstrations later in the season largely to the effort made in the beginning by the student himself on these descriptive exercises, which are issued in the first six weeks of the term.

DEMONSTRATIONS TO STUDENTS.

I would like to close this outline of the system in use here with some further details on the museum demonstrations to students. As has been said, it is in the presentation of a series of specimens in an ordered sequence that the strength of the museum system lies. In every such series, salient points will be elicited and made clear which will often have been obscure or difficult. Atelectasis, bronchiectasis, and infarction, the processes of inflammation, and of sequestrum formation in bone; the alterations in the chambers of the heart resulting from changes in the cardio-vascular system; the differing lesions of the intestine in typhoid, tuberculosis, lymphosarcoma and leukemia; fetal anomalies; these are but a few examples of the miscellaneous difficulties which a simple classification makes plain to the student, so that he who runs may read.

The following synopsis of some of the demonstrations on the circulatory system may serve as an illustration of the series shown, and of some of the points elicited.

INFLAMMATIONS AND DEGENERATIONS OF THE PERICARDIUM.

Specimens are shown of fibrinous, sero-fibrinous and plastic inflammations; of the hemorrhagic and purulent forms. Of chronic conditions are shown simple thickening and opacity of the pericardium, complete and partial synechia of its layers, milk spots, localized tags of adhesions, mediastino-pericarditis and calcification of the organized products of a past inflammation.

The difference in the gross appearances of fibrin, an inflammatory exudate covering the acutely inflamed serous membrane, and the fibrous tissue of an old inflammation that has undergone organization, is emphasized.

In severe grades of pericarditis, a myocarditis by contiguity is seen, and frequently a pancarditis, the whole heart becoming inflamed. Also it is noted that in a mediastino-pericarditis the conditions are presented for the development of physical signs during life, while in a simple adhesion of the layers to each other, no such signs need occur.

CHRONIC ENDOCARDITIS.

Under this we understand several different processes: First—A slow sclerosing process, chronic from the onset. Second—A fibroid change, beginning in absorption of the products of inflammation, often continuing on far beyond the seat and the time limit of the initial lesion, and resulting in atheromatous and calcareous change. Third—The term chronic inflammation is often used as a misnomer for heart lesions which are the result of a past inflammation, although no true inflammatory process nor anything but the direct results of the mechanical changes in the heart is now at work.

In considering the subject of chronic endocarditis, the important point is the lesions that are left behind. We will look at fusion of the segments of the semilunar and auriculo-ventricular valves, shortening of the chordæ tendinæ, crumpling, binding down, fore-shortening of the semilunar cusps—all the conditions, in short, that go to produce a valvular stenosis or insufficiency.

HYPERTROPHIES AND DILATIONS OF THE HEART AND SIMPLE ATROPHY.

In examining this series of alterations in the capacity and volume of the different chambers of the heart, or of the heart as a whole in their different degrees and combinations, together with the causes in operation that have produced these alterations, the mechanics of the condition are made much plainer than they can be at the bedside or in the postmortem room in the examination of an isolated case. In every case of extra strain on the heart, whether from extracardiac rise of pressure or from intracardiac leakages, there is a physiologic dilatation first, due to the increased size of the cavity resulting from the physiologically hypertrophied and therefore extended wall. Later on, when the hypertrophy can not meet the strain any longer, a pathologic dilatation results, and the patient dies. These points are illustrated in the specimens, as also another, that it is the chamber or chambers behind an obstruction that dilates and hypertrophies.

The following specimens are shown: Normal heart, simple atrophy of the heart in asthenic state; simple acute dilatation of the heart (parchment heart); so-called concentric hypertrophy (hypertrophy with relatively little dilatation) of the left ventricle in aortic stenosis (two cases); idiopathic hypertrophy and dilatation of the heart in overwork; hypertrophy and dilatation of the heart in arteriosclerosis, with arteriosclerotic kidneys; cor bovinum of aortic insufficiency—an enormous left ventricle with a wide cavity; cor bovinum in aortic insufficiency, with atheroma of the aorta and arteriosclerosis—an enormous heart; hypertrophy and dilatation of the heart in aortic insufficiency, with atheroma of the aorta and marked atheroma of the coronaries—a moderately enlarged heart with a greatly dilated left ventricle, pathologic dilatation having set in comparatively early before hypertrophy had gone very far; heart in mitral stenosis, showing dilatation and hypertrophy of left auricle and enlarged right heart; heart in mitral insufficiency; cor bovinum in complete *concretio pericardii cum corde* with mediastino-pericarditis; hearts showing combined valvular lesions.

In conclusion, I would express my obligation in this work to Professor Adami, director of the museum, and to the late Professor Wyatt Johnston. The museum teaching has been developed with Dr. Adami's support and kind encouragement, while many of the ideas on which the museum system is based have been elaborated at Dr. Johnston's direct initiation and suggestion.

To the artistic mounting of the specimens by the preparator, Mr. Judah, much of their usefulness to the students is also due.

DIPHTHERIA INFECTION IN MINNESOTA.

RECENT EXPERIENCES WITH THE DISEASE IN SCHOOL CHILDREN AND IN INSTITUTIONAL EPIDEMICS.*

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MINNEAPOLIS.

It is not the purpose of this communication to enter into the minute consideration of all phases of the prevention and eradication of diphtheria, but to present briefly the general features of some of the methods which have been found practicable in Minnesota and in which the laboratory has been used as the guide to executive action and restrictive measures.

In the work of the Minnesota State Board of Health, the problems have naturally arranged themselves into three main groups.

I. The routine work of dealing with diphtheria as it occurs in family life.

II. Widespread epidemics in which the day schools have to be closed.

III. Infection which gains entrance into institutions in which children or other inmates are housed, employed, taught or confined, and where great opportunity for the spread of infection is present.

I. DIPHTHERIA IN FAMILY LIFE.

The routine work of the State Board of Health is probably but little different in Minnesota from that in other parts of America except that it is confined largely to country towns, villages, small cities and rural communities. In general, isolation of suspicious cases is followed by the imposition of official quarantine, based on a positive report mailed or telegraphed from the laboratory of the board to the attending physician and the local health officer. Quarantine is maintained until a negative report or, when practicable, two successive negatives are made on throat cultures.

Modified Löffler's serum made by a rapid process is employed for the culture medium. This contains 1.25 per cent. of glycerin, the tubes are covered with rubber caps and the medium remains fit for use for twelve to eighteen months. Löffler's methylene blue is used for staining. Unless positive, no report is given on fresh preparations or, in fact, on anything other than a satisfactory culture made at the bedside, forwarded by the local physician and incubated in the laboratory for eighteen hours. In villages and towns, as also in smaller cities, no difficulties are presented, and the use of the laboratory is becoming more widespread. In country districts where it is necessary for physicians to make long journeys in order to see their patients, or where there are not physicians available, it is sometimes impractical to insist on a rigid adherence to the methods outlined for general use. Physicians are urged, and the public is educated, to take advantage of the laboratory diagnosis as a means of shortening the quarantine period and minimizing the dangers of infection.

Observations covering the years 1901 and 1902 have shown that in clinical cases of this disease diphtheria bacilli have disappeared in 3 per cent. by the 7th day,

* Presented before the American Public Health Association, Havana, Cuba.