

FOURTH  
ANNUAL REPORT  
OF THE  
PROVINCIAL BOARD OF HEALTH,  
FOR THE YEAR  
1896.

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HALIFAX, N. S. :  
COMMISSIONER OF PUBLIC WORKS AND MINES, QUEEN'S PRINTER.  
1897.

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PROVINCIAL BOARD OF HEALTH OF NOVA SCOTIA.

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HON. G. H. MURRAY *Premier and Provincial Secretary.*  
HON. J. W. LONGLEY, *Attorney General.*  
HON. C. E. CHURCH, *Commissioner of Public Works and Mines.*  
WM. H. MACDONALD, M. D., *Antigonish.*  
EDWARD FARRELL, M. D., *Halifax.*  
HON. F. W. BORDEN, M. D., *Canning.*  
A. S. KENDALL, M. D., *Sydney.*  
A. P. REID, M. D., *Medical Superintendent Victoria General  
Hospital, Halifax.*  
GEO. L. SINCLAIR, M. D., *Superintendent Nova Scotia Hospital  
for Insane, Halifax.*

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*Chairman of Board*—HON. G. H. MURRAY.  
*Secretary*—DR. A. P. REID.

# PROVINCIAL BOARD OF HEALTH,

HALIFAX, NOVA SCOTIA, 1896.

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## FOURTH ANNUAL REPORT.

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TO THE HON. G. H. MURRAY,

*Provincial Secretary,*

*Chairman of Provincial Board of Health.*

SIR :

I have the honor to submit the fourth annual report of the Provincial Board of Health.

EXECUTIVE COUNCIL CHAMBER,

*15th January, 1896.*

A meeting of Provincial Board of Health was held at 11 A. M. Present: Chairman, Hon. W. S. Fielding, Hon. J. W. Longley, Hon. C. E. Church, Dr. W. H. Macdonald, Dr. G. L. Sinclair, and Dr. A. P. Reid, Secretary.

The minutes of previous meeting were read and confirmed.

Special consideration was given to the report of the Committee (on Bacteriological research,) appointed at a previous meeting of this Board, Sept. 10th, 1895; at which "Dr. Farrell brought up the subject of the relation of bacteriological research to the public health, and the duty of the state in reference thereto, instancing the attention paid to this subject by other states and provinces, and suggesting that some steps be taken in this direction." It was finally moved by Dr. Borden, and seconded by the Hon. Attorney General, J. W. Longley, and carried, *nem. con.*: "That Drs. Farrell, Sinclair and Reid be a committee to report to this Board at its next meeting:"

1st. As to the general question of the relation of Bacteriological Science to Public Health.

2nd. As to the most economical and efficient plan by which the benefits of Bacteriological Science could be made available towards the improvement of the health of Province.

This Committee handed in the following report :

The Committee met on the 28th Oct., 1895, and recommended that a Provincial Bacteriologist be appointed, with the following duties :

1st. To provide apparatus which would permit of accurate examination and diagnosis in undefined cases of (possible) diphtheria especially, for early diagnosis.

2nd. To make arrangements for the supply of a reliable antitoxine.

3rd. Also for a reliable vaccine for provincial vaccination, so that the people be protected from small-pox.

4th. To examine and report on Sputum and discharges in suspected tuberculosis.

5th. Bacteriological examination of water in projected town and domestic supply.

6th. Bacteriological examination of water in cases of suspected contamination.

7th. Bacteriological examination of milk supply, with which might be included meat supply.

The cost of apparatus in addition to what the government now possess in government institutions would likely be under \$100.

That Dr. Hattie is qualified for the work, and would undertake it the first year for \$300.

The British Medical Association (Halifax Branch) appointed a Committee composed of Dr. D. A. Campbell, Dr. O'Dwyer, P. M. O., Dr. Hattie, and Dr. N. E. McKay, to consider the same subject, and the above committee (except Dr. McKay, who was absent) met the committee of this Board (Drs. Farrell, Sinclair and Reid), and after full discussion the above report was unanimously concurred in.

The above report was carefully considered, and on motion it was decided to ask the medical men who are in the Legislature to meet this Board and consider the subject together. Dr. Bethune, M.P.P., took a seat at the Board. At 1 P. M. the meeting was adjourned to 4.30 P. M., for further consideration.

At 4.30 P. M., meeting resumed. Present: The Hon. Chairman, W. S. Fielding; Hon. J. W. Longley, Hon. C. E. Church, Drs. Farrell, McDonald, Sinclair and Reid; also Hon. Dr. D. McN. Parker, of Legislative Council, Drs. McKay and Bethune, of the Legislative Assembly.

The report of the Committee was further discussed, and it was moved by Dr. Macdonald, and seconded by Hon. Mr. Church, that the report be adopted. This passed unanimously.

It was also moved by Dr. Macdonald, and seconded by Hon. Mr. Church, that Dr. W. H. Hattie be appointed Bacteriologist for the term of one year at \$300, under such regulations as may be made by this Board, or a committee thereof. The committee chosen to be composed of Drs. Farrell, Sinclair and Reid, who were to make all necessary arrangements with Dr. Hattie; and a sum not exceeding \$100 for Bacteriological apparatus, in addition to what is now available in Government institutions. This resolution also passed unanimously.

The subject of the review of the Health Act came up, and it was decided that the local boards of health be called on to comply with clause 14, Health Act, relating to transmissions of reports to the Government.

In clause 19, after scarlet fever, to add "or any infectious malady." Clause 21 after *wells* to add "or other water supply system." Clause 28, wherever *person* appears to add "corporation or person." At end of clause 33 to add, "the board of health shall have power to close any school or other assemblage when it decides such to be a means for disseminating disease and its closure required in the interest of the general health of the community."

Dr. Parker suggested that some means of advice *in re* the erection of new buildings, to the end that they be so situated as to avoid the probable contamination of buildings or water supply by the location of privies or stables in unsuitable localities.

On motion the board adjourned, sine die.

I would report that the instructions of the Board have been fully carried out in reference to the Bacteriological department, and would refer to the report of the Bacteriologist in the appendix to this report.

The part referring to the amendments in the Health Act were formulated for the Legislature, but I am not aware of any action having been taken.

Dr. Parker's suggestions have not yet been acted on, owing to the difficulty of knowing how to deal with it in an effective manner.

The general health of the Province has been good, and no severe epidemic has occurred. Cases of sporadic infectious diseases have occurred, and in the case of diphtheria epidemics have no doubt been prevented through the information furnished by the Bacteriological

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department, which enables each case, at its inception, to be so carefully guarded that there was no spread in the localities where the disease appeared. (See report infra.)

It is hoped that the Bacteriological department will be of special service to the profession and the public, for an early diagnosis in cases of diphtheria and tubercle, when the signs are indefinite, places the patient in a position to be better treated at an early stage of the malady, and gives greater hopes of recovery, while at the same time limiting its spread in the locality.

Few medical men have the apparatus, even if they have the skill, to make such examination, and hence many doctors in the province send on specimens for examination in doubtful cases. In very many cases doubt has been dispelled, and in others a timely forewarning given which will save, or in any case, prolong life. A good many have sent on pathological specimens for examination that the probability of malignancy or non-malignancy be assured, and the patient forewarned or have fears set at rest.

Circular letters giving explanation of the work of the Bacteriological department have been issued, copies of which are in the appendix to this report. Also a new line of work has been projected in the diagnosis of typhoid fever, the letter issued being also in the appendix.

As will be perceived by financial statement, the laboratory has been kept far within estimates. Of the \$100 placed to its credit by the Government, only \$44.53 was called for by warrant, leaving \$55.47 in the hands of the Government, and in hands of Bacteriologist, \$16.22; to the credit of the laboratory, \$71.69.

It is probable that in time the laboratory will become self-sustaining, while furnishing the people and the province a boon of no small value.

Respectfully submitted,

A. P. REID, M. D.

*Secretary.*

Victoria General Hospital,  
Halifax, N. S., 30th September, 1896.

APPENDIX.

FINANCIAL STATEMENT.

*Laboratory Receipts.*

To various sums received up to date from parties for examination of specimens of Sputa.....	\$ 28 00
Government Grant .....	100 00
	<u>\$128 00</u>

*Laboratory Expenditure.*

Postage .....	\$ 7 69
Material of various kinds.....	48 62
	<u>\$ 56 31</u>
Balance to credit of Laboratory.....	71 69
	<u>\$128 00</u>

FEES FOR LABORATORY EXAMINATION.

- (a) The Bacteriologic tests for diphtheria and  
 (b) " " " typhoid fever are performed  
 without charge.
- (c) Microscopic examination of sputum and similar examina-  
 tions, \$1.00 for each.
- (d) Bacteriologic examination of water, one sample only, \$10.00.
- (e) " " " " additional samples, each  
 \$5.00. When it is desired that the bacteriologist shall personally  
 collect samples, travelling expenses only will be charged in addition  
 to above fee in cases not necessitating an absence of more than one  
 half day, but after a half day an extra fee of \$10 per day will be  
 charged, in addition to travelling expenses.
- (f) For Bacteriologic examination of milk, the same charge is  
 made as in the case of water.



LETTER TO THE PROFESSION.

PROVINCIAL BOARD OF HEALTH.

Halifax, N. S., March 6th, 1896.

DEAR SIR :

I am instructed to inform you that at a recent meeting of the Provincial Board, a resolution was adopted, deciding upon the appointment of a Bacteriologist, with the following duties :

“ 1. To provide apparatus which would permit of accurate examination and diagnosis in undefined cases of (possible) diphtheria, especially for early diagnosis.

“ 2. To be able to arrange for a supply of reliable antitoxin.

“ 3. Also for a reliable vaccine for provincial vaccination, so that the people be protected from small-pox.

“ 4. To examine and report on sputum and discharges.

“ 5. Bacteriologic analysis of water in projected town and domestic supply.

“ 6. Bacteriologic examination of water in case of suspected contamination.

“ 7. Bacteriologic examination of milk supply.”

A laboratory is now being equipped, and it is hoped that the opportunities it will afford the profession will result in materially lessening the prevalence of diphtheria, tuberculosis and others of the infectious diseases.

In a short time mailing boxes, or outfits, will be sent to a number of stations—chosen with reference to the convenience of practitioners—where an outfit may be had upon application. At present, however, the stock of mailing boxes is small, so that they can only be supplied direct from the laboratory, but a telegram to the bacteriologist will ensure the prompt forwarding of an outfit.

Each mailing box will contain a sterilized swab, and will be accompanied with full directions for the inoculation of the swab, from a suspected exudate. When this is treated in accordance with the directions, the outfit is to be at once mailed to the laboratory. On its receipt the bacteriologist will give it immediate attention, and will usually be able, within twelve to eighteen hours, to telegraph the result of the examination. While awaiting the bacteriologist's report it is advised that the attending physician shall always treat a suspected case on the assumption that he is dealing with diphtheria.

Physicians are urged to make early use of the means which is thus provided for aiding in the diagnosis of doubtful cases. It should be remembered that even if the reply from the laboratory could not be received sufficiently early to influence the treatment of the original case, it might yet be of much assistance in deciding upon the necessity for quarantine and other precautions against the spread of diphtheria.

No fee will be charged for the outfits, nor for the examination of swabs inoculated from exudate suspected to be diphtheritic. The physician will be expected to pay the cost of the telegrams.

When desired, the bacteriologist will instruct responsible parties to forward promptly a reliable vaccine, or a trustworthy antitoxin.

For the microscopic examination of sputum the nominal fee of \$1.00 will be charged, and the board reserves the right of imposing a fee for the examination of diphtheria tubes, also, when it may appear advisable. For other work coming within the province of the laboratory fees will be arranged as low as possible.

Correspondence and specimens should be addressed to PROVINCIAL BOARD OF HEALTH, VICTORIA GENERAL HOSPITAL, HALIFAX. Telegrams should be addressed to DR. W. H. HATTIE, 11 SPRING GARDEN ROAD, HALIFAX.

Yours truly,

A. P. REID, M. D.,

*Sec'y. Provincial Board of Health.*

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#### DIRECTIONS FOR USING OUTFIT.

The patient should be placed in a good light, and, if a child, properly held. In cases where it is possible to get a view of the throat, depress the tongue and rub the cotton swab gently, but freely, against any visible exudate.

In other cases, including those in which the exudate is confined to the larynx, avoiding the tongue, pass the swab far back and rub it freely against the mucous membrane of the pharynx and tonsils.

*Without laying the swab down*, replace it in its tube, cork, put it in the box, and forward the outfit to the bacteriologist.

It should be remembered that there would be little use in sending a swab prepared from a throat which has just been treated with a bactericidal solution. At least a half hour should be allowed to elapse after an antiseptic has been applied, before making use of the swab.

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In laryngeal cases, or those in which the exudate is difficult to reach, it is recommended that a second swab be inoculated, and sent to the laboratory twenty-four hours after the first, and another after the patient is apparently well, and before quarantine is removed.

Mail matter for the bacteriologist should be addressed to PROVINCIAL BOARD OF HEALTH, VICTORIA GENERAL HOSPITAL, HALIFAX. Telegrams should be addressed to DR. W. H. HATTIE, 11 SPRING GARDEN ROAD, HALIFAX,

Laboratory No. \_\_\_\_\_ Date received \_\_\_\_\_

PHYSICIAN'S MEMO.

(To accompany outfit to laboratory.)

Physician's name \_\_\_\_\_

Telegraphic address \_\_\_\_\_

Patient's name \_\_\_\_\_ Sex \_\_\_\_\_ Age \_\_\_\_\_

Duration of illness \_\_\_\_\_ Date of test \_\_\_\_\_

Severity of illness \_\_\_\_\_

State whether contagion can be traced to any definite source, and if so, mention source \_\_\_\_\_

State whether antiseptics have been applied topically, and if so, what time elapsed between last application and using the outfit \_\_\_\_\_

Mention other treatment adopted \_\_\_\_\_

The attending physician is requested to favor the laboratory with a brief history of the case after its termination—mentioning general symptoms, complications, methods of treatment, and results.

(Space to be left blank for use of Bacteriologist.)

REPORT OF BACTERIOLOGIST.

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A. P. REID, Esq., M. D., ETC.,

*Secretary Provincial Board of Health.*

DEAR SIR:

Perhaps the most evident good resulting from the development of our *fin de siècle* science, Bacteriology, is the possibility now afforded us of making an early and positive diagnosis in at least two of the most common and most fatal of the infectious diseases — diphtheria and consumption, and probably also in a third — typhoid fever. Since the introduction of vaccination against small-pox, no advance in hygiene compares in importance with the discovery of our modern methods of diagnosis in these diseases; for not only does early diagnosis permit an active and intelligent treatment from the commencement of the disorder, but—what is of still greater importance—it furnishes absolute warrant for the prescription, at the very outset, of those rigid precautions necessary to prevent the spread of the disease from individual to individual. It is, of course, perfectly patent that the more promptly preventive measures are instituted, the more readily is the spread of contagion checked. And promptness in the application of such measures depends upon early and certain diagnosis. Thus it is that the efficiency of state boards of health has been very materially increased of late years by the general provision of laboratories where physicians, whose outfit and training do not permit personal exercise of the new methods, are enabled to profit by the aid which bacteriologic principles can alone afford. The Provincial Board of Health of Nova Scotia moved later than a number of state boards in this matter, but we now have a laboratory which, modest though it be, and quite unfitted for such excellent original investigation as is undertaken, for example in the laboratories of the health department of New York city, is yet capable of affording much assistance to those of the medical profession of this province who care to call it to their aid.

The few months during which our laboratory has been in existence have not been sufficient to give it a thorough introduction to the profession of the province, yet we are not without evidence that it is being appreciated. It was founded more particularly to aid in diagnosing diphtheria and tuberculosis, and it is mainly in connection with these diseases that it is being utilized. Fortunately, since its organization there has been comparatively little diphtheria in the province, so that the number of instances in which it has been

brought into requisition in relation with this disease has been limited. Doubtless, though, with colder weather there will be more of the disease, and more demands upon the laboratory in consequence.

#### DIPHThERIA.

Among the few occasions in which we have been able to give laboratory assistance, we have had some striking demonstrations of the utility of the bacterial test in diphtheria. Thus a young woman was taken ill in one of our largest public institutions. The throat was involved, but presented nothing distinctive. The patient was not very ill, and was not considered to be the subject of diphtheria, but, by way of precaution, a swab from the exudate in the throat was contributed to the laboratory for examination, and was found to contain the diphtheria bacillus. The discovery was of course followed by the adoption of rigid measures to prevent the spread of the disease, and happily with perfect success.

Then we can point to several other instances in which sporadic cases of the disease only aroused a faint suspicion of their true nature, and which would doubtless have been regarded as quite benign had not the bacterial test fortunately been applied and revealed their diphtheritic character. In each of these cases the spread of the disease was prevented by the timely and thorough application of preventive procedures.

Out of the eighteen specimens submitted to the laboratory since its inception, organisms having the general characteristics of the specific Klebs-Loeffler bacillus were detected in but seven. This would appear at first to be a very small proportion, but it must be considered in parallel with the fact that in only two instances did the physician feel more than a vague suspicion of diphtheria. Only twice were swabs submitted from cases in which diphtheria had been definitely diagnosed, and each time the diagnosis was fully confirmed by the test. In the sixteen instances in which no diagnosis of diphtheria was made, the organism was found five times. That is to say, *diphtheria existed in over 30 per cent. of these instances without giving signs sufficiently distinctive to permit of an accurate clinical diagnosis.* Had it not been for the bacterial test in this 30 per cent. of cases, the only circumstance which would have proven the true nature of the disease would have been its spread from the person first attacked to others. This is not a very desirable method of attaining a diagnosis, but it is really the means depended upon by those who neglect to make use of the culture method in doubtful cases.

In at least five instances then, we have been able to furnish such information as to demand those stringent measures which, modern hygiene has taught us, are required to prevent the spread of this terrible disease. The full meaning of this is impossible to estimate. It is certainly possible, perhaps probable, that in each

instance the laboratory is to be credited with averting an epidemic with its attendant suffering and loss of life—with its expense to family and community.

Eleven out of the eighteen tests gave negative results, but it would be too much to say that diphtheria is thereby positively excluded. It not infrequently happens that the specific organism disappears from the throat quite early in the course of the disease—perhaps as early as the fifth or sixth day—and consequently cultures made after the first week, even from an unquestioned case of diphtheria, may fail to reveal the diphtheria bacillus. In such case, however, the infectious element having disappeared, there is no further danger of the disease spreading from the patient to others, and the necessity for quarantine is past. This point will be again referred to presently.

On the other hand a benign organism is occasionally found which resembles the bacterium of diphtheria so strongly that it is with difficulty differentiated from it, and then only after somewhat tedious experimentation. The so-called pseudo-diphtheria bacillus has been the recipient of much attention from bacteriologists, but no agreement has yet been reached as to its exact relationship to the true bacillus of diphtheria. Some excellent authorities regard it as merely an attenuated diphtheria bacillus, which may be capable, under favorable conditions, of taking on again a full measure of virulence. Other equally eminent investigators express full conviction that the pseudo-diphtheria bacillus is an organism quite distinct from the true bacillus, and quite unable to cause disease. If the view held by this latter class is adopted, we must, of course, always feel a certain doubt as to whether an organism is really the diphtheria bacillus or merely its morphological “double,” until a full series of experiments proves its character beyond peradventure. This is a matter which requires much more time than it is desirable to have elapse before an opinion is expressed, so it is advised that a suspicious looking organism be judged specific until proof of its innocence can be brought forward. In this way, if there be any error, it is upon the safe side, and the most formidable charge that can be made against the method is that of hyper-cautiousness. And, after all, the room for error is not very great, as is illustrated by the following quotation from the report upon bacteriological diagnosis in diphtheria, published by the health department of the city of New York.\*

“The bacilli found in the original serum cultures, which in appearance and staining are identical with the typical Loeffler diphtheria bacillus, may be regarded, for diagnostic purposes, as virulent diphtheria bacilli, if the cultures have been made either from throats containing exudate or from those of persons who have been in contact with true diphtheria, for investigation has shown that over 95 per cent. of such bacilli are virulent.”

\*Scientific Bulletin, No. 1, page 52.

In order to make the laboratory available to the medical profession throughout the province, we have had a number of "outfits" prepared and distributed to various centres. These outfits are simply constructed. Swabs are prepared according to the suggestion of Shuttleworth, of Toronto—one end of a stiff wire about five inches long being tightly wrapped with non-absorbent cotton, while the other end is imbedded in a cork. The swab thus made is enclosed in a test tube, the cork acting as a stopper, and swab and tube are carefully sterilized in a hot oven. The tubes are then enclosed (for safety in transportation) in blocks of wood, so bored out that the tubes will fit accurately. A strip of adhesive plaster across the open end of the block keeps the tube in place. With each such "outfit" there is an accompanying sheet giving

#### DIRECTIONS FOR USING.

The patient should be placed in a good light, and, if a child, properly held. In cases where it is possible to get a view of the throat depress the tongue and rub the cotton swab gently, but freely, against any visible exudate.

In other cases, including those in which the exudate is confined to the larynx, avoiding the tongue, pass the swab far back and rub it freely against the mucous membrane of the pharynx and tonsils.

*Without laying the swab down*, replace it in its tube, cork, put it in the box and forward the outfit to the bacteriologist.

It should be remembered that there would be little use in sending a swab prepared from a throat which has just been treated with a bactericidal solution. At least a half hour should be allowed to elapse after an antiseptic has been applied, before making use of the swab.

In laryngeal cases, or those in which the exudate is difficult to reach, it is recommended that a second swab be inoculated, and sent to the laboratory, twenty-four hours after the first, and another after the patient is apparently well, and before quarantine is removed.

Mail matter for the bacteriologist should be addressed to PROVINCIAL BOARD OF HEALTH, VICTORIA GENERAL HOSPITAL, HALIFAX. Telegrams should be addressed to DR. W. H. HATTIE, 11 SPRING GARDEN ROAD, HALIFAX.

A blank form, as below, is also enclosed with each outfit, which is to be filled in by the attending physician, and returned to the laboratory.

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Laboratory No.——

Date received——

PHYSICIAN'S MEMO.

(To accompany outfit to laboratory.)

Physician's name——

Telegraphic address——

Patient's name——Sex——Age——

Duration of illness——Date of test——

Severity of illness——

State whether contagion can be traced to any definite source, and if so, mention source——

State whether antiseptics have been applied topically, and if so, what time elapsed between last application and using the outfit——

Mention other treatment adopted——

The attending physician is requested to favor the laboratory with a brief history of the case after its termination—mentioning general symptoms, complications, methods of treatment, and results.

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When a swab is contributed for examination, cultures are immediately prepared from it, and placed in the thermostat at 37° C. Slides are also made at once from the swab and submitted to a microscopic examination, but it is comparatively seldom that any definite information is thus gained. From the cultures, however, preparations made after the lapse of twelve or sixteen hours show positively whether or no there has been present in the exudate an organism having the microscopic appearances of the diphtheria bacillus, and a report is at once telegraphed the physician in attendance. No fee is charged, so the sole expense to the physician is the cost of the telegram.

The following druggists have been stocked with our outfits, and provide them to physicians upon application, free of charge:

R. C. Fuller & Co., Amherst.  
J. D. Copeland, Antigonish.  
C. T. G. Taylor, Bridgewater.  
Hattie & Mylius, Halifax.  
G. C. McDougall, Kentville.  
Adam C. Bell, New Glasgow.  
Dr. A. D. McGillvary, Sydney.  
Crowe Bros., Truro.  
C. C. Richards & Co., Yarmouth.

These druggists are also constantly supplied with a reliable anti-diphtheritic serum.



It is felt that these arrangements place the possibility of laboratory aid within easy reach of every physician in the province, and it is hoped that free and full use will be made of the opportunities afforded. Were the profession to enter into the spirit of the plan and co-operate with the board of health in this matter, much valuable information might be gained, and we of Nova Scotia might be able to contribute our share towards the perfection of knowledge respecting diphtheria. I was much struck by a statement made by Dr. John C. Thresh in the section of public medicine at the recent meeting of the British Medical Association at Carlisle:<sup>2</sup>

“What is most likely to throw light upon the etiology of diphtheria is not the investigation of epidemics, especially if commenced when the epidemic is nearly over, but the careful investigation of the apparently sporadic cases which are constantly cropping up, both in rural and urban districts. The study of these isolated cases, or of very limited outbreaks in rural districts would be much more easily conducted and much more likely to lead to interesting results than similar investigations in urban districts, where the possibilities of infection from person to person are usually so great as to overshadow all other causes.”

Commend that to every man of medicine in Nova Scotia. If each of our 350 physicians were to make brief notes of the conditions associated with each attack of diphtheria coming under their observation, and forward them to the laboratory, we would soon have accumulated a mass of important facts and details which it would be my delight to compile and arrange for publication.

Reference has been made to the fact that the bacillus of diphtheria is often found to have disappeared from the throat quite early in the course of the disease. Dr. Wyatt Johnston, of the board of health of Quebec province, examined swabs from the throats of 572 patients, and in 310 of these cases made subsequent examinations. He found the bacillus to be “absent in about one-half the cases by the third day after the disappearance of the membrane.”<sup>(3)</sup> But in two cases virulent bacilli were still present four weeks after the throat had been quite free from membrane. The study of 605 cases in the laboratory of the health department of the city of New York yielded the following results: “In 304 of these 605 cases the diphtheria bacilli disappeared within three days after the complete disappearance of the exudate; in 301 cases the diphtheria bacilli persisted for a longer time, viz.: in 12 cases for three weeks; in 4 cases for four weeks; in 4 cases for five weeks; and in 2 cases for nine weeks, after the time when the exudate had to all appearances completely disappeared from the upper air passages.”<sup>(4)</sup>

(2) British Medical Journal, Aug. 22, 1896, p. 436.

(3) Montreal Medical Journal, July, 1896, p. 39.

(4) Scientific Bulletin No. 1, p. 31.

Now these facts are extremely suggestive in connection with the subject of quarantine. Quarantining a house is a matter of no light import. Not only are the liberties of the occupants greatly restricted, not only are the affairs of the household very seriously interfered with, but often those quarantined are subjected to considerable pecuniary loss. Moreover it is not infrequently found that the prolonged and enforced confinement to the house of those in attendance upon the patient is injurious to their health. These two considerations—direct pecuniary loss, and illness with its indirect pecuniary loss—make, therefore, the matter of limiting the duration of quarantine a question in economy itself deserving of some attention, even if there were no more creditable motive attached. If a careful bacteriologic test proves that, in a given case of diphtheria, it would be safe to remove restrictions at the end of ten days or a fortnight, it would surely be questionable wisdom to insist upon an arbitrary 30 days' quarantine being fulfilled.

On the other hand no man can say—unless after a bacteriologic examination—that a month's isolation is enough to guard against the spread of infection. This is so well shown by the above quotations from excellent authorities that I need not dwell upon the statement. Let it suffice to say that the duration of quarantine in any case should be controlled by the result of the cultural method for determining the presence or absence of the specific cause of the disease.

A further quotation from Johnston is so pertinent as to call for no comment. "It has been abundantly demonstrated that the virulent diphtheria bacilli may exist in large numbers in the throats of persons who are apparently healthy, and who certainly do not present any of the clinical features of diphtheria, and this important discovery, viewed in its true light, should materially influence one's course in dealing with outbreaks of this disease in households or public institutions, such as schools, hospitals and asylums.

"Instead of isolating and examining bacteriologically only those cases which have sore throat, all the throats in the institution or household should be examined bacteriologically, and those persons from whom a culture of diphtheria bacilli is obtained should be isolated and quarantined, whether they are ill or not, until no bacilli are found in the throat cultures.

"This is probably the explanation of the difficulty often experienced in preventing the spread of diphtheria in households or public institutions, even after all persons actually ill have been rigidly quarantined."<sup>(5)</sup>

(5) Montreal Medical Journal, July, 1896, p. 45.

## TUBERCULOSIS.

The laboratory has been in demand more for the purpose of getting assistance in the diagnosis of pulmonary disease than in the case of throat affections. Upwards of sixty specimens of sputum have been submitted for examination, and the discovery of the bacillus tuberculosis in about one-half of the instances has proven the true nature of the patient's disorder, and thus put the physician in possession of knowledge enabling him to adopt the most effectual treatment. Every year the outlook for the consumptive is becoming more promising, and it is now well proven that when proper treatment can be adopted early in the course of the disease the prognosis is quite favorable. By affording an accurate diagnosis very early in the disease, the microscopist furnishes one of the most brilliant evidences of the utility of the bacteriologic science.

On several occasions we have been able to inform physicians that their patients were the subjects of tuberculosis before a single physical sign could be detected. In some of these instances the trifling cough had excited little apprehension, and no special treatment was being directed to the condition. The laboratory report, of course, shewed the seriousness of the condition, and at once put patient and physician upon their guard, and we may feel measurably certain that in a proportion of these cases the salvation of the patient is to be credited to the knowledge furnished.

But further. Nothing has been more firmly established by recent research than the infectiousness of consumption. Every consumptive becomes, unless he is careful to follow out certain wise instructions, a focus from which the disease may be more or less widely disseminated. Now, if a consumptive does not know that he is a consumptive, and if others are equally ignorant with him upon the subject, it follows that the disease is given every opportunity to spread. It becomes, then, a matter of the extremest importance that an accurate diagnosis should be arrived at very early in the course of tuberculous disease, not alone for the sake of the patient but for the sake also of every individual with whom he may come in contact. For simple measures intelligently applied will effectually eliminate any danger of the infection spreading, and such measures are likely to be carried out when a definite reason can be assigned therefor.

No other single disease is accountable for the same number of deaths which are attributed to tuberculosis. Of late there has been a considerable reduction in both the morbidity and mortality rates of this disease, but it still remains the scourge of our race. And yet there is reason to believe that it might be entirely eradicated. Such a result can only be obtained by the concerted action of all peoples and people, which is only a possibility of the future. But meantime a vigorous educative policy might be carried out, which could have nothing but a good effect, and which might work marvels.

The trend of the expert opinion of to-day is unquestionably in favor of legislating in this matter. Such vast good has followed the more or less efficient attempts at state control in others of the infectious diseases, that it is not unreasonable to suppose that special legislation would have the ultimate effect of markedly limiting the prevalence of this malady also. What has been done in the case of small-pox might be done in the case of consumption were proper means to such an end generally adopted. There should be exacted of local health authorities the faithful and rigid execution of the duties assigned to them. System in the inspection of the homes of the infected, with supervision of the methods of disinfecting, could not fail to be productive of good. Then it might be advisable to require that every person—man, woman, child—should submit to a physical examination by a competent physician at least once in two years, and be able to produce a certificate shewing the result of such examination. In the case of the poor, the same provision might be made that is now made for vaccination. An arrangement such as this would assure the detection of all new cases of tubercular disease in a fairly early and probably curable stage, and would permit of a thorough and proper system of notification, and thus of the adoption of the preventive measures indicated. At the same time an organized veterinary inspection should aim at the extermination of the disease from our domesticated animals.

Such a scheme suggests considerable cost in both money and individual effort, but the saving of life is worth both. And it is possible that the actual money value to the state of lives saved might be found to quite balance the expense account. I have no statistics which can be applied to Nova Scotia, but in Great Britain the sanitary advances of the last half century have resulted in the saving of upwards of 70,000 lives annually. It has been in connection with the infectious diseases more especially that this magnificent reduction in mortality has been effected. Is it too much to claim that this result is sufficient justification for the large expenditure of money made by the people of Great Britain to secure the improvement of the public health? Is it not even reasonable to suppose that the nation is fully remunerated, directly or indirectly, for its outlay in the public health service, by the many lives saved to continued usefulness and by the better citizenship obtained as a result of lessened sickness?

However, reforms are often all the better for coming slowly, and it is not to be expected that the desire of enthusiasts should be at once gratified. Moreover, the medical profession of Nova Scotia have reason to remember gratefully the great generosity shown by the government of the province in the support of our present medical institutions, and, while any further assistance in the struggle against disease would be gladly welcomed, it would be unfair to urge too strongly for additional favors. Meantime our board of health laboratory offers to physicians the most accurate

test for the early detection of tubercular disease yet known to science, and for such a reasonable fee as to debar none from benefitting by it. It is greatly to be desired that the profession should make ample avail of the advantages thus afforded them.

#### TYPHOID FEVER.

Within the past few months several bacteriologists have been engaged in the study of a phenomenon which had hitherto escaped observation. It has been found that a bacterium normally possessed of motile properties frequently loses the power of motion when brought into contact with the blood-serum of an animal immunized against that particular bacterium. Coincidentally with the stoppage of movements, the individual bacteria cluster together into larger or smaller groups. This peculiar effect is supposed to be due to the presence in the blood-serum of a product or products (strangely termed "agglutinines"), resulting from the reaction of the tissues to bacterial invasion. The blood of a person in apparent perfect health is sometimes found to be possessed of an agglutinative action, and the same is said to obtain occasionally in the case of several diseases. But it seems that, in order to secure an agglutinative effect, it is necessary to have the blood-serum at nearly, if not quite full strength, in all except one disease. "It is only in cases of enteric fever that the serum shows a distinct agglutinative action within thirty minutes, when diluted sixteen times."<sup>(6)</sup> It thus appears that the reaction can be used as a diagnostic sign.

I have been able to experiment a little with this new test, and am much impressed with its possibilities. The subjoined letter, which is being issued to the medical profession of the province as this report is being written, does not require comment:

"The very recently published results of the investigations of Pfeiffer, of Berlin, and Widal of Paris, in the study of typhoid fever, would seem to have brought this disease within that class in which a positive diagnosis can be early furnished by bacteriologic methods. The procedures of these observers have been so modified by Dr. Wyatt Johnston, of Montreal, as to make the test extremely simple. As yet there has not been made a sufficiently large number of observations to justify a claim of absolute accuracy, but enough has been proven to shew that the new discovery bids fair to be of very great practical use to physicians and hygienists.

"The typhoid organism, in the living state, is capable of very active motion. Pfeiffer and Widal have found that, when brought into contact with the *diluted* serum of the blood of a patient suffering under typhoid fever, this motility of the typhoid bacillus is quickly checked, and at the same time the individual bacilli are observed to become agglutinated into large groups. So far as is now known, the *diluted* blood-serum in no other condition possesses this remarkable property.

(6) Grunbaum,—Lancet, Sept. 19, 1896, p. 806.

“Johnston has determined that there need be no special care exercised in obtaining the serum from the typhoid patient's blood, when applying the test. A drop of blood from a needle-prick is sufficient, and it is quite available even after it has been dried for some days. The fluid obtained by moistening with water such a dried drop of blood gives prompt and satisfactory results.

“Nothing save extended observation will prove the degree of accuracy possessed by this new test, and it is the desire of the Provincial Board of Health that its laboratory may be able to contribute a share towards the elucidation of the method. It is therefore requested that a small quantity of blood, such as may be obtained from a needle-prick of the finger, be contributed to the laboratory from each case of typhoid or suspected typhoid which may come under your observation. This may be sent to the laboratory between clean slips of glass, or even in a clean bit of paper. If paper be used, the drop should be allowed to *dry thoroughly* before folding. Specimens should be forwarded as quickly as possible after collection. Such samples will be examined and reported upon without any fee being charged.

“The Board requests your co-operation in its endeavor to obtain data required to permit an estimation of the utility of the test, and would like information upon the following points :

A.—With each sample sent :—

1. Day of disease.
2. Severity of attack. State temperature.
3. Character of complications, if any.

B.—At the termination of each case :—

4. Accuracy of test, as proven by the clinical course subsequent to the time of testing.

“It is also asked that additional samples be sent occasionally to allow a determination of the length of time after convalescence the test continues to shew the reaction.

“The Board would also be pleased to have opportunities of studying this test in relation with those somewhat obscure febrile conditions termed gastric fever, continued fever, abortive typhoid, bilious fever, etc., which from the present standpoint of our knowledge are classed as typhoid by sanitary authorities.”

WATER ANALYSIS.

Three samples of water were sent in for examination. In no instance had the collection been made in such a way that a bacteriologic examination could be of any practical use. In order to obtain accurate results from bacteriologic tests, the specimens must be collected in specially prepared flasks and examined very soon afterwards. Otherwise the bacteria originally present will have multiplied to a greater or less extent, and the results will be far from correct.

Each of the samples sent to us had been collected in ordinary bottles, and without any special precautions. Moreover they did not reach us until a considerable time had elapsed since their collection. It was therefore considered inadvisable to undertake the tedious and laborious bacteriologic examination.

Each specimen was, however, submitted to chemical tests which proved great impurity, and a report was made accordingly. In one instance, at least, investigation was instigated by the report furnished, and the source of contamination discovered.

CONCLUSION.

I feel that my report is very imperfect. Such a bulk of literature bearing upon the subject of the public health has passed through my hands during the past few years, that I may possibly have come to an exaggerated estimate of the importance of the part which the application of modern advances in hygiene might be made to play in our civilization. Yet I have endeavored to express myself with moderation, and have omitted a great deal that I should like to have included, did I not feel that the report has already become too lengthy.

In submitting it, I have to acknowledge my deep indebtedness to you for many kindnesses you have shown me, and for the unflagging interest you have manifested in the workings of the laboratory. Very frequently indeed I have felt the need of counsel, and on all such occasions have found you ready with helpful suggestions and valuable advice. I trust that you may find in my report something of a practical nature, which may be useful to you in your capacity as Secretary of the Board.

Your obedient servant,

W. H. HATTIE.

Laboratory of Provincial Board of Health,  
Victoria General Hospital,  
Halifax, N. S., October 1st, 1896.