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Dominion Medical Monthly

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ORIGINAL ARTICLES.

(No paper published or to be published elsewhere as original, will be accepted in this department.)

A BRIEF NOTE ON ANTI-DIPHTHERITIC SERUM OR DIPHTHERIA ANTITOXINE.

By CHARLES FORBES, M.D., etc., London, England,
Late Surgeon Warsa Gold Mines, West Africa, London Correspondent to *Indian Medical Record* etc., etc.

The history of all therapeutic discoveries involving complex physiological problems, has a charm for most medical men, many of whom are highly gifted disciples of science in its broadest sense. Cicero says, "*E nihilo nihil fit*," but it is curious to note what slight and fortuitous circumstances may lead towards or elicit a discovery which may thereafter confer great benefits on the human race by leading up to the successful treatment of one of our most fatal maladies. Baginsky rightly remarked that 'it was difficult to fix the exact therapeutic value of anything in diphtheria. About ten years ago, in conjunction with others, I gave small doses of precipitated sulphur, supplemented by insufflations of powdered sulphur. This plan certainly proved efficacious in many cases. Still later it seems to have suggested to Dr. R. Brownlow Martin the idea of treating this disease by means of "tabloids" of magnesium sulphite grs. 5 in each, at frequent intervals, employing in addition insufflations of the same into the pharynx and larynx, by means of a [special insufflator with movable glass barrels and an apparatus which at the same time depresses the tongue (manufactured by Burroughs, Wellcome, & Co., London). This and the "tabloids" are a great improvement in method, and according to Dr. Martin's little book on the subject, highly efficacious. These facts have been amply proved by clinical reports in the current journals. Despite these facts, diphtheria cases treated in hospitals show the hideous mortality in mixed cases of 50 per cent. and upwards. On the other hand, the injection of anti-diphtheritic serum obtained from immunized horses by Roux's method, has reduced the previous rate of

mortality from diphtheria by at least one-half. This is a great advance in therapeutics. Moreover, no ill effects follow the hypodermic injection, save only in some cases a transient urticaria and slight œdema at the site of puncture, disappearing in less than half an hour. Now, just a word as to the events which led to the adoption of this plan of treating diphtheria. The first attempt to protect patients against diphtheria was set on foot in Italy in 1868; fifteen children were inoculated with the diphtheritic virus, but one died. Bogola (Sienna) shortly afterwards inoculated twenty-nine children with this same "materies morbi," but did not lose any of his patients. So much for remote history. The discovery of the true bacillus diphtheriæ by Klebs and Lœffler, 1883-84, placed the matter on a scientific basis. The next stage of the proceedings was that Roux, and Yersin, and others, by cultivating the virulent bacilli in broth for some time, found that they gave rise to one or more toxines or ptomaines. Behring and Kitasato proved experimentally by injecting cultivations of the bacillus into guinea-pigs. Behring succeeded in immunising animals, as also have Kitasato and Frænkel, but what is more noteworthy as the crowning touch of the discovery, Behring found that he could cure animals of diphtheria, however produced, by injecting a blood serum obtained from the jugular veins of animals rendered immune by repeated previous injections of the diphtheritic toxine. Behring's researches in every particular are corroborated by Roux, who found, moreover, that by mixing a certain proportion of anti-diphtheritic serum with the solution containing the toxine and hypodermically injecting the mixture into animals, no effect was produced (*Medical Press and Circular*, September 26th, 1894). Aronson began to immunise horses in 1893, when he demonstrated that the "serum" obtained from these protected animals was a valuable prophylactic against diphtheria. Behring, Aronson, Ehrlich, and Roux agree that the horse should be selected as the source of the curative serum, as it can safely be inoculated with larger quantities of toxine, and is more speedily rendered immune.

Dr. Roux states the results of the injection of anti-diphtheritic serum which he obtained in conjunction with Drs. Martin and Chaillon at Hospital for Sick Children, Paris, between the dates of February 1st to July 24th, 1894: 448 cases, 109 deaths, mortality 24.33 per cent.; under old treatment, 1890-94, 3,971 cases, mortality 51.7 per cent.

Behring comes to some remarkable conclusions, published *in extenso* (*Berlin. Klin. Wochenschrift*, October, 1894): (1) That many poisons (snake venom, etc.) can be antagonised by blood serum treatment; (2) that the only blood antitoxine that can antagonise disease is anti-diphtheritic serum; (3) that 100 cases of diphtheria treated within the first forty-eight hours of attack by the injection of a 10 cc. dose of the serum, not five will perish from diphtheria; (4) that this serum is a specific in an eminent degree; (5) that each blood antitoxine has a curative effect on one morbid product only; (6) that it is formed when the diphtheria toxine meets the reactionable albumen of the body, *i.e.*, the blood; (7) that the antitoxine or antidote after

injection preponderates in the blood and tissue juices over the toxic material of the diphtheria bacillus.

The following table will serve to illustrate the clinical success of the remedy in Europe (*British Medical Journal*, October 20th, 1894):

AUTHORITY.	NO. OF CASES.	MORTALITY.
Behring and Kossel	30	20.0 per cent.
Ehrlich	96	15.05 "
Ehrlich, Kossel, Wasserman	153	23.60 "
Weilgen	66	28.0 "
Katz	128	13.20 "
Wettger	63	28.0 "
Roux	448	24.33 "
Aronson	192	14.0 "

A total of 1,226, giving a mortality of about 20 per cent.

A series of over forty cases of diphtheria treated successfully by various practitioners throughout England by injecting anti-diphtheritic serum. Rumor also states that Dr. Klein has prepared a supply of serum, and that Messrs. Burroughs, Wellcome & Co. are now in possession of a large quantity produced from their own horses with exceptional care. The hypodermic syringe I employ and advise others to make use of, too, is manufactured by Burroughs, Wellcome & Co. It possesses the following good points: being thoroughly aseptic, can be sterilized by boiling, and the platino-iridium needles likewise can be heated to redness in a spirit flame without tarnishing or softening the metal, as platinum, though unaffected by heat, in this combination is a great heat conductor. I must add that all hypodermic punctures should be made under strict antiseptic precautions into the muscles of the back or buttocks, after washing the skin with a lotion (one "soloid" of corrosive sublimate to a pint of water).

NOTE.—It is important that the syringe employed should be completely sterilized, both before and after use, while manipulating anti-diphtheritic serum. As to the dose of serum to be injected, that should be from 5 cc. to 30 cc.; the earlier the treatment is begun, so in proportion the dose can be reduced. Ten cc. is a fair dose, but in bad cases 20 cc. can be injected at once with above mentioned precautions, and repeated in twenty-four hours if temperature remains high and pulse rate undiminished; these generally, however, fall within a few hours after first injection. As to local treatment of the throat nothing need be done beyond the occasional use of solution similar to the undermentioned:

R Boracio gr. xxx.
 Glycerini (vel paroleini) ℥iv.
 Aq. ad ℥i.

passed into the larynx, etc., by means of a paroleine atomiser. I trust these few hints will be found of service to your readers, as I hear that diphtheria is prevalent in Toronto.

87 St. Augustine's Road, London, N.W., England,

December 5, 1894.

Reports of Societies.

FIRST QUARTERLY MEETING OF PROVINCIAL BOARD OF HEALTH.

Dr. Macdonald presided at the first quarterly meeting of the Provincial Board of Health, at the Health Department, January 17th. The other members present were: Drs. Rac, Oshawa; Kitchen, St George; Vaux, Brockville; Covernton and Cassidy, Toronto, and Dr. Bryce, Secretary. A communication was received from Hamilton stating that the ice crop, after being cut on Burlington Bay, is floated through channels in the ice towards the ice-houses. In its transit, this ice is necessarily exposed to pollution from the sewage-laden waters of the bay, and there is danger of its being used for domestic purposes. The Secretary will remind the local health authorities of the law on the subject. A letter from Barrie informed the Board that diphtheria had broken out in Vespra township. Advice will be given that a health officer be at once appointed. A communication from Strathroy stated that all the small-pox patients there had recovered and had been discharged. The cost of the outbreak to the municipality was given as \$1,600. The action of the Secretary in advising that properly disinfected bed-clothing, which had been used by small-pox patients, might be given the McCallum family whose house had been burned to prevent the spread of the disease, was approved. A communication was received from Pickering respecting the alleged feeding to hogs of diseased horse-flesh and

knackers' refuse. A committee consisting of Drs. Kitchen, Rac and Cassidy was appointed to investigate this matter and to confer with the Minister of Agriculture. A complaint was received from Sandwich West township respecting the inactivity of the local board of health in reference to the small-pox outbreak. A specific complaint was that persons had been allowed to go about too freely. The Secretary will refer the local health authorities to the stringent provisions of the Act. Word was received from the village of Wyoming that the hotel where scarlet fever had occurred had been improperly placarded. The placard was not put up on the front door as it should have been, but upon the inside of the back door. The Secretary will direct the local health authorities as to their duty.

At the afternoon session the Board adopted a report of the Secretary containing suggestions for the sanitary improvement of Coal Oil Inlet in Hamilton Bay. The five chief causes of possible pollution were given as these:—the sewage from the eastern main sewer of the city; the drains from Laurie's pork-packing establishment; Rawlin's knackry; the Stroud cattle barns; Freeman's superphosphate works. Dr. Bryce recommended the construction of tanks of masonry for the reception and subsequent precipitation of the sewage. According to this plan the sewage is to be discharged by syphonage every twelve hours into a series of delivery pipes running to a point two feet above high level of the bay water, and is to be made to filter through sand prior to entering the bay.

The quarterly report of the Committee on Epidemics showed that during 1894 there were thirty-six cases of small-pox in the Province, five deaths and fifteen introductions or an average of two and one-third. At the present time there are five cases, one in Toronto, one in Windsor, one in Sandwich West township, one in Sandwich town and one in Elma township, all of which are of a mild type. Several of the cases reported were traced to Detroit and Chicago. The report continued :

"While the Committee may congratulate the Province on its health organization, which has produced for 1894 so satisfactory a statistic as the above, it cannot but express the opinion that the patient endurance of the lack of efficiency in dealing with outbreaks of small-pox in a neighboring State which, in 1885, and again in 1892 and 1893, encouraged and insisted upon the maintenance of a border quarantine by the Marine Hospital Service of the Federal Government has ceased to be a virtue. For months chaos has reigned in the City Health Department of Detroit ; small-pox has been treated in private houses in the centre of the city ; private physicians have gone in some instances from patients with small-pox, to attend patients sick from other diseases ; patients suffering from mild forms of the disease have, it is stated, been allowed abroad within a fortnight of the onset of the disease, and again and again have new cases occurred from people going from houses supposed to be disinfected, while such gross carelessness seems to have prevailed that persons unprotected by vaccination were allowed to work

around the small-pox buildings. Of the latter it is stated the fatal case of small-pox which occurred in December last in St. Thomas is an example. The Committee is not aware how far State supervision in the matter of the public health in Michigan exists, but certainly the state of affairs which has existed during the past eight months demands an early and radical cure on the part of someone."

The Committee stated that the several outbreaks which have occurred during the year have again brought into prominence the need of some regular provision being made for supplying trained nurses and physicians at a moment's notice.

MEDICAL INSPECTOR NEEDED.

The need of a medical inspector to give personal attention and direction to outbreaks of small-pox is further amply illustrated by the presence of diphtheria in many localities. The total municipalities reporting outbreaks during the last three months is at least seventy-five officially reported, while private information states that the disease exists in many other localities, from which no reports have been received, but whence physicians have sent for antitoxine. Diphtheria is as contagious under the conditions of close contact in the close and fetid atmosphere of a church or schoolroom as small-pox or any other of the eruptive diseases. Even with imperfect methods of collecting information the disease was reported during 1894 from 110 municipalities, or more than one-seventh of all organized in Ontario, and during the last quarter at least seventy-five municipalities

have reported its presence. In a town with a population under 10,000, twenty-five cases in thirteen days of the present month were reported. Here is present a disease causing a percentage of deaths from twenty-five to thirty-five of cases, mounting up during the year at the present rate to several thousands. Were small-pox present to even a hundredth part that diphtheria has been during the past five months the business of the Province would be paralyzed. Referring to the distribution of antitoxine by the Health Department the Committee said that the demand had been quite active, showing at any rate that many physicians were interested in the therapeutic value of the new remedy. A large amount of antitoxine had been sent out, but the Secretary had received a very limited number of reports. The physician using the remedy had too frequently failed to realize the object of the Board in distributing it, and had looked upon the department as a convenient depot at which to obtain a supply of a new drug.

"It is hardly necessary," the Committee said, "to remark that with such reasoning, let antitoxine as a remedy be ever so wonderful, it is doomed to more or less failure owing to its improper use. How far it is the duty of the Board to continue to maintain a supply on hand if such a view of it is to continue is not for your Committee to decide. While on the one hand, by enabling the Board to keep itself informed of outbreaks which under old conditions it was not aware of antitoxine has proved of great value, it may, it is feared, serve to divert the energies of physicians and

health officers from the exercise of those preventive measures which the Board has been endeavoring to inculcate in the past, and which, whether with antitoxine or without it, are the only sure means by which we can hope to finally eradicate diphtheria."

The report was received and the discussion on the same laid over till next day.

The Board resumed its sitting at 11 a.m., January 18th. Owing to the temporary absence of Dr. Macdonald, the chair was filled by Dr. Conerton. Dr. Cassidy then presented his report on Anti-Diphtheritic Serum.*

This report was adopted. After a general discussion on the use of antitoxine in diphtheria, it was moved by Dr. Cassidy, and seconded by Dr. Bryce, "That, having heard the reports of the services afforded by the use of antitoxine in Europe, America, and in the Province of Ontario, the Board expresses approval of this course of treatment, and wishes the secretary to continue to supply the antitoxine to physicians desirous of using it." The motion was carried.

J. J. McKenzie, B.A., presented the laboratory report.†

A report was then presented by Dr. Cassidy showing correspondence with the New York Pasteur Institute about the antitoxine of tetanus, and containing a request made by the Toronto Clinical Society that the antitoxine of tetanus should be procured by the Board, so as to be made available,

*This report has appeared in our January number.

†This report appears on page 45 of this number.

when necessary, to the physicians of the Province.

The report was adopted, and the secretary was instructed to correspond with the New York Pasteur Institute, or with Dr. Tizzoni, of Bologna, Italy, so that the most reliable preparation of this antitoxine may be obtained.

On resuming in the afternoon a letter was read from Mr. Doran, the Stipendiary Magistrate at North Bay, about an outbreak of diphtheria at Warren, with six deaths from the disease.

A complaint was received from Clifton House, near Niagara Falls, about the horse manure accumulated near the cab-stand.

Dr. Johnson, Sarnia, wrote asking the opinion of the Board as to the propriety of vaccinating prisoners in gaol at that place.

A communication was received from S. Nordheimer, Esq., the Consul-General of Germany, inquiring if a microscopic examination is made of the tissues of hogs killed in Canada for trichnia, etc. The importance attached by the German Government to this question was due to the fact that large quantities of hog products were exported from Canada to Germany. A reply was sent by the secretary informing Mr. Nordheimer that no such examination was made.

The Chairman's annual address was then read by Dr. Macdonald.*

The report was adopted.

Dr. Bryce submitted a report on behalf of the Committee on Epidemics upon the question of a Home for Consumptives.†

The report was adopted, and the Board adjourned until next morning.

On Saturday morning (January 19th), on resuming, the Board passed accounts for vaccination, and for attending to an outbreak of diphtheria in the unorganized territories.

Plans of the proposed waterworks at Port Hope were submitted and referred to the Committee on Water Supplies.

A report was read on a contemplated water supply for Bracebridge. Action was deferred until plans are prepared.

Instruction was given to the Committee on Legislation to take such action as would secure the amendment of Section 30 of the Public Health Act, so as to make clear the control which the Board should have over the establishment of sewerage, and, also, to secure the amendment of sub-Section 4 of Section 616 of the Municipal Act, with regard to the powers of Local Boards of Health to initiate works.

A letter was received from Dr. A. C. Robertson, of Maynooth, asking the terms on which he could obtain a supply of antitoxine, as diphtheria had broken out there. The outbreak, he said, had started in the midst of a score of lumber camps, and, if it got a foothold there would be a bad outlook for the lumbermen. A supply of antitoxine will, it is understood, be forwarded to Maynooth.

The special committees on the burial of the dead and tuberculosis were continued.

The report of the special committee appointed to inquire into the sanitary condition of the shoddy manufactories of the Province, was read by Dr. Kitchen.*

*The Annual Address appears on page 38.

†This report appears on page 43.

*This report appears on page 49.

The report was adopted, and the Board then adjourned.

THE ANNUAL ADDRESS OF THE
CHAIRMAN.

By J. D. MACDONALD, M.D.

To the Members of the Provincial Board of Health :

GENTLEMEN,—The year past has not been an idle time for the Board, and still less so for its Secretary. The list of business done is tolerably large, too large to be noticed here in detail. It has included investigations into the drainage of towns ; enquiries respecting nuisances complained of in many localities, and respecting the origin of outbreaks of diseases ; into the condition of Ontario with reference to its protection from the inroads of *infectious* diseases, particularly of small-pox, by revaccination of the healthy and the isolation of the sick. There have been lengthened discussions on the subject of tuberculosis. Scarlatina also demanded our attention, as did typhoid fever, in its outbreak not far from this city, and in a locality much frequented in summer by families of its inhabitants. Respecting this invasion it may be remembered that its origin was exposed and the mode of its suppression pointed out by Mr. McKenzie, the analyst of the Board.

The Board also has had its representatives at meetings of scientific societies. Dr. Kitchen, at the Congress at Rome, merits our thanks, as do also those who represented us at that held in Montreal at a later period. The matters which required our most anxious attention had relation not alone to our own Province, but also to the health conditions of

the regions bordering upon us, to wit, those across the lakes. In these latter, in their large and populous cities and towns, the dangers which it is our duty to obviate often exist in a greater degree than among us ; so that we and our neighbors, having a common interest as regards our health conditions, it is the constant endeavor of our Board to provide, that within our own bounds there lurk no sources of evil to those who dwell near us, as well as to prevent, as far as we may be able, the transmission of evil from our neighbors to our own people.

It seems not out of place here to say, perhaps it may be only to repeat, that institutions, such as this, which we form, have not only their own peculiar usefulness, but have, moreover, an influence in promoting a sentiment of common interest and interdependence on the part of neighboring peoples, and thus, in removing the jealous rivalry so often existing between these, to the discredit of their good judgment and civilization.

We were constrained to have a special meeting in July, convened because of the appearance of small-pox in the northern part of the Province, bordering on the lakes, the disease having been brought thither in vessels sent for the conveyance of lumber to the American cities. Since that time a perpetual vigilance has been necessary to prevent, if possible, the transmission of the disease from those cities. The effort, it has to be confessed, has not been altogether successful, and up till the end of December we have to record a gradually increasing number of localities where sickness in this form has appeared

and where deaths have occurred. It is needless here to advert to the reasons why this loathsome and destructive but preventable malady prevails so much in the American cities near us. No doubt sanitarians there are strenuous in their efforts to check or to stop its progress. They, however, have to encounter unfavorable conditions, and these are likely to create many centres for the diffusion of the trouble. A short time ago a serious note of warning was sent to a life assurance company in Canada, from one of its medical advisers in Detroit, with reference to the increased risks which were to be encountered by the company in its business in that city, and he recommended that it should seriously consider the propriety, or the prudence, of including revaccination amongst its requirements.

It will be seen that such an institution must have an insuperable difficulty in adopting such a course. The necessity of this additional safeguard seems plain, in the general interest, but some stronger influence than that of a business association working in its own interest will be required to bring revaccination into general favor. The additional safeguard might again be in some way brought under public attention, by the efforts of this Board and its provincial auxiliaries. Happily, as yet, the people of Ontario have not had a very general necessity for testing the benefit of revaccination, but it is well that the measure should be kept before them as a probable necessity. In the meantime, the prevalence of small-pox has become such that it has been thought prudent, in the public interest, to issue weekly bulletins of its increase or

diminution. So far, increase alone has had to be noted.

Within the last year the Board has had to deal with a disease of uncertain nature. Its place in nosology we would have liked to have seen distinctly stated. The case was at one time said to bear a strong resemblance to leprosy. So far that suspicion has not been verified by the evidence of men who have had more opportunities of seeing leprosy than has been the lot of physicians in Ontario. The characteristic bacillus could not be found and the disease was concluded to be syphilis. The subject of it was a tramp of more than ordinary filthiness, who appeared to look upon his condition as of advantage in his vocation. He was remitted to an hospital for treatment. Perhaps it need not be noted, as a matter of surprise, that great difficulty was experienced in getting an hospital to consent to admit him.

The Board's Committee appointed to deal with the subject of tuberculosis has been continuing its work. More especially has it been aiming at causing the public to appreciate the infectiousness of the malady. The efforts of the committee have not been so successful in that direction as some of its most zealous advocates of infection thought might be reasonably expected. It is hardly a matter of surprise that men are difficult to be persuaded regarding this matter. Differently from other diseases of a recognized infectious nature, as, for example, the eruptive fevers, phthisis and its cognate affections of bone or gland, seem to have no period of marked prevalence. It holds possession of the community continually,

and destruction of life from it has no intermission. So its coming or going are not to be observed, as can be done in the class of diseases which have given a character, in the general opinion, to diseases which are admitted to be infectious. In its course, too, it is so gradual and insidious that, before its presence is suspected, it has had time to give a marked character to the bodily frame and appearance of its victims, so that it has come to be thought to be not the cause of a certain bodily configuration and general appearance, but the result of these; and as, in the meantime, it has had a long opportunity of infecting a whole family, or a whole social circle of relatives and friends, it has come to be popularly regarded as an inherited disease, with the existence of which external conditions have merely a secondary relation. Further, being everywhere present and always, it seems as if it were of the character of a natural force, and too great to be successfully contested by puny human opposition. So numerous are its subjects that the separation of the sick from the healthy, so as to prevent infection of the latter, would seem to leave too great and sad a gap in the family and social life of very many. It is such a consideration as this which makes the proposal of "homes" for consumptives so much the object of dislike to both the friends and the physicians of those who are consumptive. Both friends and physician know that the final parting will come soon, but neither like to anticipate it. In the eye of both, the departure of the consumptive for the "home" is, so far as the family is concerned, the first step to the funeral of one who

is the especial object of the sympathy and affection of the household. The family physician likes not to be called on to recommend the step, and the whole family shrinks from the avowal which it implies. These considerations may be taken as a sample of many which are offered by the opponents of the establishment of "homes" for consumptives, and it may probably be some time before these parties will look kindly on the proposal that the Government of Ontario should legislate or vote money for such institutions. In the meantime the duty of those who believe in the possibility of stamping out consumption is to continue urging on the notice of the country and the Government the reasons for their belief, and to point out a practical mode of giving effect to it. No doubt facts will force conviction sooner or later, and the infectiousness of consumption, as of tuberculosis in other forms, will come to be known and provided against; but the evidence will be of a kind which will be the more slowly admitted to be conclusive the longer it is drawn solely from observations on the human subject. From the insidious, protracted nature of the disease, and by reason of the social habits of men, it is very difficult to prove infection. Indeed, it is due to the necessarily imperfect nature of observations on man that the idea of the infectiousness of consumption has been lost for a while. Sixty years ago the belief in it was very general, at least among the laity. About that time a school of physicians arose, one of whose efforts it was to discourage the idea of infectiousness, and old men have heard courses of lectures delivered, of

which the aim was to ridicule it. Its absurdity, as we were told, was especially manifest in the spread of yellow fever and of Asiatic cholera. Some of us have books on our shelves, the works of men who have been our own contemporaries, whose denial of infectiousness extend even to such a disease as scarlatina.

We now can apply more correct tests than were attainable in past times. Microscopic research has given ocular proof of the reality of infection, and of the mode of its action, while observation of disease, natural or artificially induced, in the lower animals, has afforded opportunity for tracing more distinctly the passing of infection from one subject to another.

With respect to the infectiousness of tuberculosis many veterinarians have arrived at very conclusive results. The subjects by means of which these gentlemen have their more perfect opportunities for observation can be more easily kept in control and under observation. They are not permitted to wander at will, or go in the direction of evil influences. The result of the observation of many veterinarians seems to be all in favor of the certainty of infection as the source of tuberculosis in the animals which they treat, and so exclusively the source that they assert, that no matter how a herd of cattle may be cared for and housed, whether its condition be one of dirt and general unwholesomeness, or one of cleanliness, comfort and healthfulness, tuberculosis will appear among them if it is brought, and not otherwise. Unhealthy surroundings will not cause its appearance, and opposite conditions are no safeguard

against it. These views have been distinctly put forth at a conference of veterinarians with a Medical Association in the United States, and reported in the *Boston Medical and Surgical Journal*, for the perusal of which I am indebted to Dr. Cassidy. I have thought it well to advert to this matter in this way, in order that attention may be called to the views of the Board on the subject of the infectiousness of tuberculosis in all its forms. The subject is not now one for discussion by the medical profession alone, but must take its place among those which are topics of consideration among all men. In the meantime the public seems hardly prepared to accept the views of the nature of phthisis or tuberculosis which have been just stated; and we may expect on the part of many as much opposition, and withal as heated, as that which in some quarters is being offered to vaccination. Nay, perhaps a better organized opposition for maintaining it. We may expect to find opposed a large portion of the medical men of the country, who naturally will not look favorably on plan or system which may remove their patients from their own care. Until that opposition is weakened or overcome, much cannot be expected from governing bodies. These necessarily leaning on public opinion, as they must do, under our constitutional systems, cannot go in advance of that opinion. It is beyond their function to do so. Therefore, the general acceptance by people and by governments will depend upon the light which they get from this and other such institutions, as these persistently hold forth what are well-grounded

scientific views on the infectiousness of this very prevalent malady.

The last matter to which we shall advert is one of surpassing interest, a new light which, if found to be a true light, will be next in importance to the discovery of Jenner, second to that discovery only, because it does not promise, like vaccination, permanence in its effects. It is not prophylactic, as cow-pox inoculation is, in a majority of instances. We refer, of course, to the new mode of dealing with diphtheria, by the subcutaneous injection of what in the meantime, for want of a better name, goes by that of "antitoxine." If we are to rely on reports from scientific centres, this substance, while apparently in the hands of some a means of saving many lives, is not to be allowed by others to pass unchallenged as a curative agent in diphtheria. Many men of mark still strenuously deny its usefulness, and aver that they who suppose that they have tested its usefulness successfully have been following a phantasm; that they have often been in error in diagnosing diphtheria, and, of course, as often wrong in their conclusion regarding the curative effects of the agents, which they have been employing to stop the course of that malady. Notwithstanding this opposition to the claims to usefulness of antitoxine, its employment is increasing and so, also, its good reputation seems to grow. So hopeful is the medical profession of its good results, that there is no doubt but that the treatment by means of it will have a fair trial, and that its value will be determined before long, and if, as is claimed for it, it is curative in many instances, so as to

make it manifest that the percentage of deaths is greatly lessened, its value will have been confirmed. Meantime, however, it is not to be forgotten that diphtheria epidemics have not been always of equal fatality, or attended by equal distress. Time may show that we are at present, the world over, experiencing an epidemic in which numbers of cases run their course favorably, owing perhaps to the prevalence of better hygienic conditions. Hence it is not impossible that a considerable proportion of the success attending the use of antitoxine may be delusive; but there appears no room for doubt, even in the supposed conditions, that much relief has been gained, much suffering prevented, and many lives saved by the injection of the serum charged with antitoxine. If the success of the material thus used becomes assured, other vehicles less offensive than infected serum of the animals may be found, and our friend, the analyst of the Board, has informed us that the whey of goat's milk has been found as useful as blood serum. The new substance is certainly less repulsive to the imagination than the old. Within our own working limits, we have occasion to estimate the value of this, or of any mode of procedure from which relief might be hopefully anticipated from the sufferings resulting from diphtheria. On the list of contagious diseases which have prevailed in Ontario within the past year, and which has been prepared in the Secretary's office, it will be seen how great has been the comparative prevalence of this malady. It is nearly equal to that of all other diseases of the group. Nay, it may be said truly that, on the

authority of that list, it is more than equal. In many of the reports transmitted to the office its "prevalence" is merely mentioned, or there are "some cases" or "some families" affected, but the cases are not enumerated. There is, however, enough reported to justify the belief that in its prevalence and mortality diphtheria exceeds all other contagious diseases put together. In this character we would, however, remind all that, destructive as diphtheria is, it is infinitely less so than the history of small-pox shows the latter always to have been, and still to be, in communities unprotected by vaccination. On view of the growing aversion to the comparatively trifling annoyance caused by vaccination as compared with the dreadful destruction of life of small-pox unchecked by this little operation, it will be well that our own and other populations, were reconciled to the practice of compulsory vaccination under heavy penalties. No one, in the gratification of a fancy or even in the carrying out of a conviction, has a right to make himself and his family a centre of mortal injury to the community in which he and his family or friends live, and which affords him protection.

Among the duties of the Board in the direction of improved water supply and of drainage, may be mentioned its successful endeavor in behalf of the former in the case of the town of Ingersoll, and its, as yet, unsuccessful dealings with the city of Hamilton with regard to the latter. Ingersoll had certainly good cause to apply for our intervention, but a visit of inspection by a committee and its representation of the necessity of im-

provement to those whose duty it was to afford the pure supply of which the town stood in need, were followed by immediate and successful operations on their part. As to Hamilton, no such success has attended our efforts to bring about the improvement desired. The nuisance is excessive and affects the interest and the comfort of a large neighborhood. There are, however, interests opposed. The work, too, will be expensive, and the city hesitates to embark in it. The public burdens are already heavy, and there is much to do which is even more important than the matter of its "inlet pollution." But in a little time, no doubt, steps shall be taken to move in the direction required by both the Local Board and by this Board. The sense of what is right and creditable to itself will cause the city to make pure and pleasant the shores and inlets of its beautiful bay.

REPORT ON A HOME FOR CONSUMPTIVES.

By P. H. BRYCE, M.A., M.D.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee on epidemic has for several years reported on the problem of how to lessen the great death rate from tuberculosis in Ontario, and presented at the last quarterly meeting proposed regulations for placing tuberculosis on the list of notifiable diseases.

The more, however, that the problem is studied the greater the urgency seems to be for the establishment, as a corollary to such compulsory notification, of a Home for Consumptives on some inland and elevated tract of warm and dry soil, protected by an

evergreen forest growth, and conducted under conditions which have been found most successful wherever such sanitarium have been established.

It would further seem to your committee that such provision can only be realized in the near future by its establishment being undertaken by the Government; and that thereafter, when it has gained public recognition, the counties might be encouraged to establish in favorable localities similar homes, modelled on that erected by the Government.

Such a home would necessarily be something between an hospital and a sanitarium, the maintenance of which might be, in considerable part, provided for by the products of agricultural, horticultural and other industries, and by the moneys received from pay patients of the better class.

The arguments for the establishment of such an institution may be briefly summed up as follows:

1. That, according to the Hospital Report for 1892, one patient of every twenty amongst the 11,008 inmates of the General Hospitals of the Province was tuberculous; while almost as many more, or 4-5 per cent., suffered from acute bronchitis or pneumonia, a considerable proportion of whom, according to medical experience, are likely to have subsequently developed consumption.

2. That, the amount of Government aid to the hospitals in 1892 for the maintenance of these 1,197 patients, was at the rate of, say thirty cents per diem—\$359.10—which, if the number were maintained for the whole year, would have amounted to \$131,071.50.

3. That the General Hospitals in the different cities of the Province have not in any single instance, as far as your committee is aware, any method, as by separate wards, for preventing the consumptives (one in every twenty) from mingling with patients suffering from acute and exhausting diseases, which render them especially liable to inoculation with tuberculosis.

4. That with 750 deaths in the twelve cities of the Province during 1892 from tuberculosis, and probably as many more persons suffering from the disease, there was as a result a notable danger of such persons spreading the disease not only within their own families, but also amongst their fellow-workmen and workwomen so long as they were able to perform labor, forced upon them by their limited means.

Other arguments, put in a more general way, have been presented in the Report on Tuberculosis prepared by your Secretary, and published by the Board last year, as well as in articles read before the Association of Executive Health Officers in August last, and published in that report.

Proposals to establish an hospital for consumptives in Toronto have, as you are aware, been made, but so far the idea has taken no definite shape.

However valuable such an institution, if established, will become, it cannot as an hospital fulfil the conditions which most recommend themselves to your committee. As is well known the lakeside cities, and even rural municipalities bordering on our great lakes, have an incidence

of deaths from consumption notably greater than the inland and more elevated counties. The following table, published before in previous papers, may be repeated, and year after year, may be illustrated.

Deaths from tuberculosis in cities in 1891, 1892 and 1893 in Ontario.

Cities.	1891, Ratio per 1000 of Pop.	1892, Ratio per 1000 of Pop.	1893, Ratio per 1000 of Pop.
Toronto	2.4	2.5	2.6
Windsor	2.7	1.2	1.6
Kingston	2.2	2.1	1.8
Hamilton	1.8	1.5	1.7
Bramford	1.7	2.0	2.4
London	1.6	1.3	1.3
Belleville	1.4	2.0	1.7
St. Thomas	1.4	1.2	.0
St. Catharines	1.3	2.0	1.9
Ottawa	1.2	1.8	2.4
Queph.7	1.5	2.1
Stratford8	.0	1.1

It seems, therefore, apparent that the location of such a home of a provincial character must be chosen with a view to the very best location from the climatic and geological standpoint.

It has been stated elsewhere that from the calculation based on the annual death rate, probably five thousand consumptives are at any one time living within the Province. If it were assumed that even a number equal to those treated at present in hospitals for tuberculosis and other pulmonary complaints were provided for gradually, it would mean an institution not larger than one of the provincial institutions for the insane at the present time.

Without going further, however, into the question, your committee believes the time has arrived when the demand for such an institution is general.

It commends itself to the Inspectors of the Department of Public Institu-

tions, both from the public health and economic standpoints; and your committee would therefore recommend the adoption of the report, with instructions to have it forwarded to the proper authorities for consideration.

This is all the more urgent in view of the fact that the point was raised in the discussion with the Government of the proposed regulations for the compulsory notification of tuberculosis—if consumptives were prevented from engaging in employment in workrooms and factories, where mingling with others was necessary, that other disposition of them was at present impossible.

All of which is respectfully submitted.

PROVINCIAL BOARD OF HEALTH LABORATORY REPORT.

By J. J. MCKENZIE, B.A., Bacteriologist and Analyst to the Board.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—The work of the Laboratory during the past year has been, as heretofore, partly chemical and partly bacteriological. The following is a summary of the work done:

Chemical analyses were made of water samples as follows: Wells from Alton, Ont., four samples; well at Lorne Park, one sample; Lindsay public water supply, two samples; St. Thomas public water supply, two samples; Windsor water supply, four samples; Belleville, three samples; Oshawa, one sample; Belleville Deaf and Dumb Institute, two samples; Goldsmith, one sample; River Thames at Chatham, two samples; Lake Erie water near Chatham, two samples;

Chenal water, Chatham, one sample ; Port Hope, one sample—twenty-seven samples in all. These analyses, which owing to their length are here omitted, will appear in full in the annual report of the Provincial Board of Health.

Bacteriological and chemical analyses were made of two samples of cheese and one of bread supposed to have caused ptomainic poisoning. The results were negative.

Bacteriological examinations were made of the following water supplies : Ingersoll, three samples ; well at Lorne Park Station, one sample ; Windsor public water supply and Detroit river, four samples ; sewage effluent, one sample ; Battleford Indian Industrial Home, five samples (wells suspected to have caused typhoid) ; Belleville Deaf and Dumb Institute, two samples ; well at Goldsmith, one sample ; wells at Lynn, two samples ; Chatham City supply, three samples ; Port Hope, two samples ; Peterboro', fourteen samples (river water, public supply and wells).

A considerable increase in the work of the Laboratory has been occasioned by the action of the Board in offering to make for the rural municipalities and towns examinations, free of charge, of suspected diphtheria exudate and sputum from suspected cases of tuberculosis. It is surprising, however, that notwithstanding the exceeding importance of such examinations for the early diagnosis of these diseases, health officers and others should not have availed themselves more extensively of the Board's offer. It is practically only since November 1st that the number of samples sent in have begun to in-

crease, and this is apparently not so much due to the first circular issued by the Board as to the distribution of diphtheria antitoxine, the instructions in regard to the use of which included again a reference to the necessity of a bacteriological diagnosis and advice as to methods of taking samples and shipping to the Laboratory for examination. In some cases, even where advantage was taken of this offer of the Board, the results have not been satisfactory, owing to the culpable carelessness of the sender. Although the instructions were made as explicit as possible, still some physicians have sent the samples packed in an exceedingly loose and careless manner, either from simple inattention to details or on account of the expense involved in packing carefully. I am inclined to believe the second has been more frequently the reason, especially since recently one medical health officer objected to paying the cost of the telegraphic report upon a diphtheria membrane!

The necessity of care in these matters is of so much importance to myself and others who may handle the packages, that I have adopted the following procedure in regard to them :

If the material were not enclosed in a bottle it was destroyed without being examined, and the sender notified of the reason. If it were enclosed in a bottle, but the bottle not enclosed in a wooden or metal box, it was examined, but the sender was warned, and if he transgressed again the sample was not examined, but destroyed. This method has been successful in most instances, but it will be necessary when new circulars are printed

to be even more explicit than in the last.

In all, from June 1st, 1894, to January 15th, 1895, eighty-one samples have been examined (excluding, of course, samples destroyed). Of these eighty-one, thirty-six were suspected exudates, forty-one suspected sputum, two fæces from suspected intestinal tuberculosis, one urine from suspected tubercular cystitis, and one a tubercular liver abscess. Of the thirty-six suspected exudates twenty-eight proved to be diphtheritic, and eight non-diphtheritic; of the forty-five samples suspected to be tuberculous thirty were found to contain the bacillus of tuberculosis, and in the remaining fifteen it was not found.

These eighty-one samples were divided according to the months, as follows :

Months.	Diphtheria.	Tuberculous.	Total.
June	1	9	10
July	0	6	6
August	0	8	8
September	6	2	8
October	6	3	8
November	3	7	10
December	12	7	19
January (half mor.'h)..	9	3	12

An arrangement of the samples according to this source makes more apparent the lack of interest which medical health officers have taken in this work : One physician sent six samples, two physicians sent five samples, one physician sent four samples, six physicians sent three samples, nine physicians sent two samples, and twenty-five physicians sent one sample.

Latterly, as far as possible, a record has been kept of the micro-organisms associated with the diphtheria bacillus in exudates, but in the absence of

clinical data for the cases, and with carelessness in taking the samples, no conclusions of importance can be drawn from these results. As a rule the commonest associated form has been a short streptococcus or diplococcus (it occurs in both forms), which in many respects resembles an aberrant type of diplococcus pneumoniae. The streptococcus longus, the most important associated form for the prognosis, has been noticed but seldom.

The method of packing described in the circular of the Board has proved fairly satisfactory where carefully carried out, but the suggestion to seal the cork in the bottle with sealing-wax I have found objectionable. I would suggest that in a new circular the sealing-wax be omitted.

In a recent paper by Dr. Hesse, of Dresden, in the *Zeitschrift für Hygiene*, upon the bacteriological diagnosis of diphtheria, a suggestion is made which I think might, in some instances, be used here. Dr. Hesse does for the district in which Dresden is situated the same work in regard to diphtheria which I am doing here, and he has found the following method most satisfactory. Medical practitioners are provided with sterilized test-tubes, through the cotton plug of which passes a sterilized glass rod. When a case occurs, the rod and plug are removed from the tube, the rod is rubbed over the suspected membrane, then returned to the tube, which is enclosed in a box and sent to the Laboratory. When it arrives, the infected rod is again removed and rubbed over the culture medium. The advantages of this are twofold : first, the greater cleanliness ; and, second,

the fact that if it is desired to take into account associated forms, the drying of the film on the rod prevents the development of saprophytic bacteria, which always occurs in a piece of moist membrane enclosed in a bottle. Since seeing this paper I have had one opportunity of using the method. This was in a case of diphtheria in which the exudate had disappeared from the throat ten days before. The rod was rubbed over a spot where membrane had existed, and was brought to me twenty-four hours later. I succeeded in getting a good culture of the bacillus of diphtheria.

It would not be possible to use this method in all cases, but in larger municipalities with health officers fully alive to the necessity of an early bacteriological diagnosis, I think it would be well to attempt it; and in case of special outbreaks, it would certainly be the best method to pursue.

Among the eighty-one samples examined there are only two of sufficient interest to merit a more extended report. These were in connection with a number of cases of quinsy which partook of an epidemic character. The first case was fatal, and was not considered diphtheritic at all, except that there appeared on the fauces a glazed white patch, as if membrane was about to form. The funeral was public, and two of those who were at it about a week later developed throat trouble. In one case, a child, it was diagnosed follicular tonsillitis, and ran the usual course; in the other case, a young man who had had several attacks of quinsy, the disease was diagnosed quinsy. Pus formed in the tonsils and there were glazed white patches in the

fauces, one as large as a twenty-five cent piece. Wipings were sent me of these patches, and of the tonsils, but the diphtheria bacillus was not found. The bacteriological examination showed only diplococci like *diplococcus pneumoniae*, and a streptococcus.

Four more cases occurred in the same house. Pus formed in every case but one, and the pseudo membrane was present in all. A specimen was again sent me from the fifth case, and the bacteriological examination failed to reveal the bacillus of diphtheria. On account of the interest attached to the case a more thorough examination was made. A portion of the cotton with the exudate was dropped into sterile bouillon, allowed to grow for forty-eight hours, and then injected (1cc.) into a rabbit. The rabbit survived, having a slight lump at the point of inoculation for two weeks. Another portion of cotton with the exudate was enclosed in a pocket in the skin of a guinea pig. It developed a lump at this point, which finally broke, and the pus was found to contain *staphylococcus pyogenes albus* and *streptococcus longus*. The animal finally died.

The bacteriological cultures from the exudate showed the following forms:

1. *Staphylococcus pyogenes albus*.
2. A form which occurred in diplococci and short streptococci.
3. *Streptococcus longus*.

A rabbit was infected subcutaneously with 1 cc. of a twenty-four hour bouillon culture of the *streptococcus longus*. It developed a lump at the point of inoculation, but this disappeared in about ten days. At the end of two weeks the animal died,

and the streptococcus could not be found in the organs or blood, but was still present at the point of inoculation.

The results of these inoculations seem to show that the streptococcus longus had in these cases a low degree of virulence, and it is possible that its presence accounted for the diseased condition, and for the apparently infectious character of the outbreak. In this connection it must be remembered that streptococcus longus is the form which is almost constantly present in scarlatinal anginas, and there seems to be little doubt that wherever found it is simply a variety of the form which has been called streptococcus pyogenes or streptococcus erysipelatis. In virulence it varies exceedingly according to the source from which it is derived, and in cultures in the Laboratory any virulence which it may have is speedily lost.

A series of original investigations have been begun this year on the subject of synthesised culture media, but the work is not sufficiently advanced to merit a report.

All of which is respectfully submitted.

REPORT ON SHODDY MILLS IN THE PROVINCE.

By E. E. KIRCHEN, M.D.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your Committee appointed to enquire into the condition of the shoddy manufactories of this Province, from a sanitary standpoint, beg leave to report that they have had considerable correspondence and interviews with the Inspector of Factories, as well as

having visited and made a personal inspection of a number of factories in operation.

The term "shoddy" is more especially applicable to the raw material, as manufactured at some four or five different mills, and is generally known by the term "extract." The best of the "extract" is sent to the woollen manufacturers, to be made up into cloth and blankets, etc., while the refuse is used in the manufacture of mattresses, upholstery and coverlets. Some of the mills manufacture their shoddy from old, filthy rags, collected by pedlars or imported from foreign countries, and use no new material, while others use only cleaned rags and new ones collected as clippings from tailor shops, etc. We cannot do better than give you the process as we found it followed in a few of the mills visited.

First Mill.—This factory obtains rags of all sorts from pedlars, from Toronto, Detroit, etc. The rags, as received, are in a filthy state, and are sprinkled with a little sal-soda solution, and without any washing go directly to the "picker." The room is extremely filthy where the process goes on, and then they are sent to an upper room, where dust accumulates upon them, and then go directly, with or without admixture with new wool, cotton or clippings, to the rollers, where they are made into flocks or batts. These batts, averaging about two pounds each, fall on the dirty floor, and are then packed and sold direct to the manufacturers of mattresses, bed-comforters and cheap upholstery. These rags are bought for seventy-five cents per one hundred pounds. The fulling machine re-

duces their weight by about 33 per cent. These mattresses are made up mostly of swamp grass, faced with these batts. The man in charge did not know of any disease from these rags in recent years, except skin diseases; but tells that in 1864, when he worked in a similiar mill in Galt, there was a spread of small-pox from the rags in that mill. We might add that this shoddy is also sold to the manufacturers of felt.

The flocks are taken and mixed with rags and an adhesive compound; and steam at high pressure is forced through them, which would seem to remove any danger from such material. In this mill eight men are employed, and more than seven hundred pounds of rags daily are used.

Second Mill.—This mill is under good and intelligent management. It gets rags from all quarters local, and largely from London, England. They likewise get a large quantity of union rags from other mills, more particularly woollen mills. It employs about eight hands steadily, and has good buildings, and everything well arranged. This mill occasionally supplies batts, from union rags, for mattresses and comforters, for customers; and also supplies a large quantity of the shoddy used in various woollen mills. The principal work of this mill is to treat union rags by the patent process of "carbonizing." This process is carried out by driving fumes of hydro-chloric acid, made from salt and sulphuric acid, into a revolving cylinder, double jacketed, and heated with steam in the jacket. This method first requires some two hours heating to dry the rags, aided

by a fan, after which the acid fumes are forced in from a retort. The fumes destroy the cotton fibre completely; the carbonized fibre falls from the rags leaving the woollen portion behind uninjured. These are sent to woollen mills and made into cloth. This process will completely disinfect the rags, and is known by the name of "Cole's Patent Process." There are three other mills in the province using the same process. The reason given for its not being more generally used, is its expensiveness. The owner says he knows of no disease originating from rags since its use amongst the employés.

Third Mill.—This is a woollen shoddy factory, and employs 150 hands, and has ninety-six looms in operation. They secure rags from all points, and buy, especially, so-called soft woollens, as knitted goods, etc., and also new clippings. Do not buy old rags at all. In this factory the first operation is to separate light colored goods from dark, and then put them in large color vats and boil them from two to five hours, and add dye stuffs, chiefly madder and logwood. These are afterwards taken out and dried with steam heat, and dusted to get rid of the excess of coloring matter. The union or mixed goods are then assorted from the all-wool goods, and the all-wool rags go to the "picker," while the union are sent to Cole's mill at Doon, to be carbonized and get rid of the cotton. The picked rags go to the weaving-room, after leaving the "picker," where the different qualities of wool are made up with new wool, cotton, etc., and come out as cloth with all the freshness and beauty of new wool goods.

These mills give a fair example of the treatment of rags in all the shoddy and shoddy woollen mills of the Province. The process in the last two mills is eminently satisfactory, while that in the first mill is a fair representation of others of its class, and is equally unsatisfactory.

In closing our report, we would recommend: (1) That immediate steps be taken to prevent the introduction of rags into this Province from a foreign country, without their being accompanied by a certificate vouching for their thorough disinfection. (2) That all rags, except new ones, be required to undergo a thorough process of disinfection before being passed through the "picker."

Attached to this report are the names and addresses of all shoddy and shoddy woollen manufacturers, who are now doing business in the Province of Ontario.

A. K. McKay & Co., Woollen Mills, Orillia; Mrs. Sarah Harrison, Woollen Mills, Owen Sound; Auburn Woollen Mills Co., Woollen Mills, Peterboro'; Woollen Mill, Streetsville; Canada Mattress Co., Toronto Junction; T. Andrews & Co., Woollen Mill, Thornbury; Weston Woollen Co., Weston; W. C. Pollock, Almonte; David Sheppard, Almonte; J. M. Schiedel, Breslau; J. T. Huber & Co., Doon; Mrs. Margaret Cooper, Galt; J. O. Hutton, Huttonsville; James Porritt, Port Elmsley; John Kirkham, Rouge Hill; Harding & Co., Simcoe; Wm. S. Duncan, Stratford; Smith Wool Stock Co., 219 Front Street East, Toronto; New Toronto Wool Stock Co., New Toronto; A. Bauer & Co.,

Waterloo; Cole & Co., Doon; Sykes, Ainsley & Co., Glenwilliams; Samuel Beaumont, Glenwilliams; Shuh, Waterloo; Rumbel Felt Factory, Berlin.

WOOLLEN, KNITTING AND SHODDY MILLS.

Standard Woollen Co., Front St. East, Toronto; Joseph Simpson, cor. Esplanade and Berkeley Streets, Toronto; M. J. Smith & Co., 169 Front Street East, Toronto; Toronto Mill Stock Co., 123 River Street, Toronto; John Fisher & Co., Woollen Mill, Alinston; Wm. Algie, Knitting Mill, Alton; Benj. Ward, Knitting Mill, Alton; Peterboro' Mattress Co. Ashburnham; G. Hogg, Woollen Mill, Barrie; C. Young, Woollen Mill, Beaverton; W. Lott, Woollen Mill, Belleville; H. J. Bird, Woollen Mill, Bracebridge; Trent Valley Woollen Co., Woollen Mill, Campbellford; G. Routh & Son, Woollen Mill, Campbellford; Telfer Bros., Woollen Mill, Clarksburg; Joseph Atkinson, Woollen Mill, Cataract; Cobourg Woollen Mill Co., Woollen Mill, Cobourg; E. Cook, Woollen Mill, Gananoque; Wm. Morrison, Woollen Mill, Lambton; David Graham, Woollen Mill, Inglewood; John Beemer, Woollen Mill, Inglis Falls; Jacob Messinger, Woollen Mill, Hanover; John McMurchy, Woollen Mill, Huttonsville; Kingston Hosiery Co., Woollen Mill, Kingston; Markham Woollen Mills Co., Woollen Mill, Markham; W. H. Perry, Woollen Mill, Napanee; James Randle, Woollen Mill, Meaford; A. Jackel, Woollen Mill, Midland; G. Upton, Woollen Mill, Nicolson; James Cumming, Woollen Mill Norwood.

Special Selections.

HÆMOGALLOL AS A SUBSTITUTE FOR THE INORGANIC PREPARATION OF IRON.

Wm. Henry Porter, M.D., in *Post-Graduate*, says: While in many instances the older and inorganic preparations of iron are amply satisfactory, there are still many cases met with in which these iron preparations prove absolutely worthless in every respect. And even at best the iron in any of these forms is still an artificial and absolutely unnatural preparation.

Therefore it was desirable to secure some preparation that would more closely follow the indications of the natural chemico-physiological laws which govern the animal economy.

A little more than two years ago Professor Kobert, of Dorpat University, succeeded very largely in satisfying these requirements.

This was accomplished by taking the hæmoglobin of the bullock's blood and acting upon it by means of a reducing agent, such as pyro-gallol.

This deoxidizing agent displaced the oxygen almost or completely from the hæmoglobin, and left as the final product a smooth powder of reddish-brown colour containing all the constituents of the normal hæmoglobin except the oxygen. To this substance he gave the name hæmogallol. It is an almost tasteless powder, which can be administered in solution, in pill or capsule form.

Hæmogallol is absolutely non-irritating to the most delicate and sensitive stomach, and can be administered in every possible form of anæmia dur-

ing the height of the acute infectious diseases, even during the fibrile period, with advantage.

Professor Kobert found that hæmogallol was absorbed very rapidly from the alimentary tract, and taken into the entero-hepatic circulation, and that when the hæmoglobin was deficient in quantity in the blood it was rapidly increased under the steady introduction of this compound.

The hæmogallol when it reaches the circulating blood appears to seize readily the oxygen in the blood and take up again its previous complement of oxygen which was displaced by the deoxidizing agent, and thus it reverts back to hæmoglobin.

This much accomplished, the reproduced hæmoglobin incorporates itself rapidly with the globulin elements of the red corpuscles, and thus the total percentage of the hæmoglobin in the blood and in the red cells rapidly rises.

When more hæmogallol is introduced into the circulation than the system can possibly utilize in the restoration of the hæmoglobin to its normal standard, the excess of hæmogallol or unoxidized hæmoglobin, passes rapidly out of the body with the urine, without producing any untoward effects upon the kidneys, and without any unpleasant symptoms further than an increased colouration of the renal excretion. A good drug is simply wasted if more is administered than can be utilized. If now at the same time that the hæmogallol is being exhibited the proper kind and quality and amount of food is supplied, rapid improvement in the physiological state must follow.

At the same time the circulation,

respiration, digestive and glandular actions must receive whatever attention is necessary to bring them as nearly as possible to the normal standard.

All these conditions satisfied, the hæmogallol will rapidly augment the oxygen-carrying power of the blood corpuscles, general assimilation will be rapidly improved, the anæmic state will disappear and a normal standard will be quite rapidly established. All pathological processes will tend to give place to those of a normal type.

Since the introduction of hæmogallol, the author has used more than twenty pounds of this compound, with uniformly good results.

Anæmic conditions of years' duration, in which all other forms of iron had failed, responded quickly and completely to hæmogallol until perfect cures were effected.

In the anæmia of the chronic diseases such as lithæmia, oxaluria, neurasthenia, rheumatism, nephritis, and diabetes, hæmogallol has produced much better and more decided results for good than any other form of iron tried or commonly used in these cases.

The most elegant method for administering hæmogallol is in combination with sugar or chocolate, faintly flavoured with vanilla, and then compressed into tablets or pastilles.

The chocolate pastilles which are commonly found in the market are known as hæmogallol chokolade-pastilles. Each of these pastilles contains 0.5 grammes (7.5 grains) of the hæmogallol.

One of these pastilles at a time is an average dose for an adult, although

three or four times that number can be taken three times a day. One-half to one pastille is the average dose for a child.

This form of iron, on account of its great palatability, is particularly adapted to children and those who are specially fastidious.

The hæmogallol tablets, made up extemporaneously from the hæmogallol powder, so far as my experience goes, are equal to any in the market.

Hæmogallol appears to yield the best results when taken about one-half hour before eating.

This form of iron is especially valuable on account of its great palatability and the ease and rapidity with which it is assimilated.

Thus far only good results have been obtained from its use, and as yet no contraindication has been met to oppose its free and universal administration.

THE PREPARATION OF DIPHTHERIA ANTITOXINE BY ELECTROLYSIS.—Smirnow gives in the *Berliner Klinische Wochenschrift*, No. 30, 1894, an account of experiments which he has made on the preparation of antitoxine by electrolysis, in the hope that this method might supplant the tedious and expensive method of animal immunisation. After injecting a dose of pure bouillon culture of diphtheria, which proved fatal in a control experiment, into guinea-pigs, he employed bouillon cultures through which a current of electricity had been passed, as a *heilserum*, with successful results. He is hopeful that the serum prepared by electrolysis may be effective in the human subject.

THE PRACTICE OF PRIMARY AMPUTATION IN TRAUMATISMS OF EXTREMITIES IN CIVIL LIFE SHOULD BE DISCONTINUED.*

First.—Conceding that an amputation is an opprobrium of the healing art, that its performance always entails an irretrievable sacrifice, the dictates of conscience, sentiments of humanity, our patients' well-being, our own reputation, and, many times, corporate interests, all enjoin on us the importance of resorting to this procedure after injuries only as an extreme and last resort, when the resources of science are exhausted and we are positively assured that resuscitation of the damaged parts is out of the question.

Second.—As a general rule, unless the shattered, mangled limb has been quite totally destroyed or has been traumatically amputated, immediately after injury, no one can pronounce whether the limb is in a state of temporary asphyxia, suspended animation or is permanently devitalized.

Third.—As serious or mortal shock from internal, organic injury, not infrequently is associated with the mechanical disorganization of an extremity, the question of severing the limb should not be entertained until reaction; for, to amputate in the moribund state, or in the presence of collapse, is not in consonance with sound tenets of surgery.

Fourth.—In all such cases of mangleing of a limb as may entail the severance of it, enough has been accomplished at the primary dressing

if all shattered and entirely detached fragments of bone have been removed, efficient hemostasis secured, the parts thoroughly cleansed, the limb placed in comfortable position, dressed and splinted.

Fifth.—Resection, ebonation and modern osteoplastic operations, when judiciously and skilfully employed, in a large number of cases, will now enable us to preserve many limbs, which heretofore have been ruthlessly sacrificed.

Sixth.—The allegations that the dangers of septic infection, gangrene or tetanus are augmented by discarding primary amputations are not supported by facts.

Seventh.—By delay, until vital processes are established, advantage obtains through (a) our patient being now better able to sustain the shock of an additional mutilation; (b) a demarcating line, clearly isolating the decomposing from the living tissues; (c) through improved nutrition, aiding recuperative processes, and (d) lastly, but not of trifling importance, it permits of a truce by which one is enabled to carefully analyze his case, consult with his confreres and authors, and decide with deliberation and discernment on the most judicious course to pursue.

Eighth.—As the upper extremity is the prehensile organ of the body, by the use of which our existence is maintained, and, besides, preserves a vitality and regenerative properties far in advance of the lower extremity, an immediate severance of it, or any of its digital appendages, after an accident, when these are not wholly and irrevocably destroyed, trenches on the border line of positive malpractice and cannot be too severely condemned.

*Abstract of paper by THOMAS MANLEY, M. D., visiting surgeon to Harlem Hospital, New York.

Ninth.—Nearly every description of a distorted lower extremity, free from pain, is vastly more valuable than the most expensive or elaborate prosthetical appliance for its substitute for either support or locomotion. Regardless of how or where a stump is formed, but very few ever bear an artificial limb with any degree of comfort.

Tenth.—To prematurely or injudiciously amputate a limb is a most grievous calamity, for the loss is irretrievable, and its restoration is quite beyond human possibility; while to procrastinate at its very worst can work no greater damage to the member; the only debatable feature in the subject remains: Are our patient's prospects of recovering with his life diminished by waiting until vital processes determine with precision the living margin.

Eleventh.—Traumatically amputated parts or limbs are those in which, though there may not be a complete physical detachment of material structures, the living bond is severed, vessels and nerves are destroyed, the parts are reduced to a pulp and hang together by the integuments, tendons or fasciæ; or may have been quite completely ground or torn off. These cases do not, strictly speaking, belong to the category embraced within the above resume, for the reason that, as vital detachment has been effected, the question of a formal amputation of any description is quite out of the question.

conclusions: (1) Laparotomy is the only rational procedure in all cases of gunshot wounds of the abdomen where there is reasonable evidence that the ball has entered the abdominal cavity, and each moment's delay will materially lessen the chances of recovery. (2) If there is a reasonable doubt as to whether or not the ball has entered the abdominal cavity, give the patient the benefit of that doubt by doing an early exploratory operation for diagnostic purposes. (3) In wounds of the pancreas complicating gunshot injuries of the intestine a resection of this gland may be done, care being taken not to include the head or common duct, as death invariably follows such procedure. (4) The segmented cat-gut rubber ring being unaffected by the imbibition of intestinal secretion is one of the very best aids in circular enterorrhaphy or lateral anastomosis. (5) A ring composed wholly of cat-gut is entirely worthless as an intra-intestinal support on account of its highly absorbable qualities. (6) When the Lembert stitch includes only the serous or a part of the muscular coat they do not, as a rule, ulcerate their way into the bowel, as is claimed by some, but usually become encysted and remain near their place of introduction. (7) An intestinal wound when properly treated usually becomes securely sealed in from six to twelve hours by the formation of plastic peritoneal exudation; but this must not be too confidently relied upon, as it may be very materially retarded. (8) If there arise evidences of suppurative peritonitis, do a second abdominal resection, disinfect the cavity and apply drainage.

GUNSHOT WOUNDS OF THE INTESTINE.—In an article on this subject Dr. Hefeefinger, in the *Texas Courier-Record*, draws the following

IMPROVED METHOD OF LAVAGE.— (*Brit. Med. Jour.*) A very simple improvement in the apparatus for washing out the stomach, a procedure often of great value in the treatment of gastric disorders in childhood, has been described by Dr. W. Beattie Nesbitt, in the *Archives of Pediatrics*, September, 1890. The fluid is obtained as usual from a siphon bottle placed above the level of the child, but the india-rubber tube from this bottle is connected with the stomach catheter, not by a piece of straight glass tubing, but by a glass tube shaped like a widely-open tuning-fork; the handle of the tuning fork is connected with the stomach catheter, one limb with the tube from the bottle, and the other with a waste tube conducted into a suitable receptacle. It is convenient to have the tube from the bottle and the catheter of red rubber, and the waste tube of black rubber. The tubes from the two limbs are placed over the forefinger of the right hand, and are held loosely in the palm; either can then be easily compressed by the thumb. When it is desired to fill the stomach, the catheter having been introduced, the waste tube is compressed, and the fluid readily flows into the stomach from the bottle; when the stomach is to be emptied the red or siphon tube is compressed, and the black released. If the eye of the catheter becomes blocked, as often occurs, the current is easily reversed by compressing the black and releasing the red tube. Dr. Nesbitt recommends the use of a mouth gag, and, after inserting the tube, places the child on its side, with the face slightly downward. Before removing the catheter the stomach is

filled quite full. An act of vomiting generally follows the withdrawal of the tube, or, if not, it may be excited by titillating the fauces. "In this way," writes Dr. Nesbitt, "I have often seen removed large pieces of coagulated putrid casein, half an inch to an inch in length, of such a tough leathery consistence that no amount of washing would have broken them up."—*Journal of the American Medical Association.*

VIRCHOW ON THE SERUM TREATMENT OF DIPHTHERIA.—The Berlin correspondent of the *British Medical Journal* writes that Virchow gave his opinion with characteristic caution. He said that he had been inclined to be sceptical as to the good results obtained in diphtheria last summer in the Kaiser and Kaiserin Friedrich Hospital, as he thought none of the cases was of the severest type. In August, however, the supply of anti-toxine fell short, and since then the mortality from diphtheria in the hospital had risen remarkably, showing that the epidemic was severe in character. He summed up his opinion as follows: The serum exercises a strong protective influence for weeks, perhaps months, say three or four months. Whether this influence be lasting can be shown only by further experience. Moreover, this alone can furnish the answer to the cardinal question, Is it a specific for diphtheria? But much has already been gained when, for instance, it is possible in a family where three or four children are down with diphtheria to immunize even one child, and this, in all probability, can be done by the serum.

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MEDICAL EXPERTS.

There have been columns written on the subject of medical expert testimony, and the importance of it is again brought to our notice by a case which was tried recently in the criminal court. There physicians of good standing gave evidence directly opposed to one another, and, as would be expected, the defendant was able to secure excellent testimony in his case, we understand, for the fee of \$40.00. The Crown in this case pays but \$4.00, which, of course, is a ridiculous amount when you consider the time and annoyance it is to a physician to have to wait around all day at the beck and call of the Court.

It is perfectly apparent to a medical man how conscientious, yet absolutely diverse views may be taken in the same case by two men, each equally

qualified. It becomes usually a matter of interpretation of symptoms as stated to them, of a case which they never saw, by people entirely unskilled and ignorant of the value or importance to be attached to the different symptoms which they profess to remember or the conditions which they think existed. This being the case, it is no wonder that the conscientiously opposing opinions of physicians in giving evidence should not be received in the manner they deserve; in fact, they become the subject of ridicule with the laity, and professional experts have become a by-word among the people.

It may be said it is a very easy matter to criticise, but it is a more difficult matter to suggest a remedy. We think that the remedy is so simple that we cannot conceive why it has not been applied before. Medical expert testimony of a scientific character should not be at the beck and call of every prosecuting attorney or of the defence; it should take the position it deserves to take. The man of science should not be the servant of either side; he should be the judge of scientific facts, and of evidence put in in support of such facts. It is only by occupying this—the judicial, the only correct position for the man of science to occupy—that his talents and training are of most service to the public and the law. We would, therefore, suggest as an immediate and easily applied remedy for this class of testimony, that experts should be adjuncts of the Bench; that the man to select the knowledge required should be the judge without influence or direction from any source. If this be

done, and physicians cease to be the servants of contending parties in the Courts, it will be but a brief period until we are entirely rid of the odium which professional expert testimony has brought upon us.

ANTITOXINE.

Antitoxin or Antitoxine.—The *British Medical Journal*, in speaking lately of this word, points out that the name was originally copyrighted by the proprietor of one of the new coal-tar compounds, which is used, it is said, with much success as an antipyretic, having no depressing action on the heart. As the *British Medical Journal* says, it is a question whether the copyright will be able to hold its own against usage, as the term antitoxine is generally applied to the serum for diphtheria, tetanus, etc. It is a question how far either of the names are pathologically correct. However, judges are not pathologists, so it may easily be decided which will win.

HEALTH NUMBER.

We are sure that the profession will appreciate the space we have given this month to the reports of the Board of Health, as it places the many physicians in town and country, who are frequently consulted in regard to this question, *en rapport* with the present work of the Board. Our thanks for the reports in the present issue are due to one of the members of our staff, Dr. J. J. Cassidy, member and ex-chairman of the Provincial Board of Health.

Book Notices.

White's Materia Medica. Edited by WILCOX SECORD. American edition, \$3. Philadelphia: P. Blakiston, Son & Co.

This work is one of those which naturally become a sort of companion to the physician, being of such a size, compact, condensed yet authoritative, that it becomes invaluable for ready reference. Those who have had the first edition are aware of its merits, those who have not should lose no time in becoming acquainted with them.

Orthopedic Surgery for Students and Practitioners. Illustrated with two hundred and eighty-five woodcuts. Philadelphia: Lea, Bros., & Co.

This is, indeed, all that it claims to be, and while the art of illustrating has advanced greatly in recent years, we cannot say that the illustrations excel the clearness and lucidity of the text. As the most recent and thorough exposition of surgical science in the treatment of deformities, this book should be in the hands of every practitioner.

Directions for Laboratory Work in Bacteriology. By FRED. NOVEY. Ann Arbor, Mich.: Geo. Water.

The science of Bacteriology has been so simplified as regards the almost mechanical manipulation, that it should be almost a hobby for every physician to rest him by change of occupation. Some of Koch's greatest work was done as a country doctor, and certainly in all such matters as examination of sputum, etc., etc., we should hardly expect to see

to-day the physician who should require assistance. To all who are doing any kind of work Dr. Novey's book will be of great assistance.

Text-Book of Normal Histology. By GEO. A. PIERSOL, M.D., Professor of Anatomy in the University of Pennsylvania. Philadelphia: J. B. Lippincott Company.

The second edition of this valuable work excels the first in wealth of illustration, which, of course, is to be expected in such an exhaustive work on histology. This work, either in the hands of the student or practitioner, will be found invaluable in giving that thorough grounding, in normal conditions of tissue, without which all pathological teaching is wasted.

Obstetric Surgery. By EGBERT H. GRANDIN, M.D., Obstetric Surgeon to the New York Maternity Hospital, Gynæcologist to the French Hospital, etc.; and GEORGE W. JARMAN, M.D., Obstetric Surgeon to the New York Maternity Hospital, Gynæcologist to the Cancer Hospital, etc.; with eighty-five illustrations in the text, and fifteen full-page photographic plates. Royal Octavo, 220 pages. Extra cloth, \$2 50 net. Philadelphia: The F. A. Davis Co., publishers, 1914 and 1916 Cherry Street.

This work is one which should be in the hands of every practitioner. All the operations are well illustrated, and the descriptions clear, terse and accurate. Much has been done also to simplify and perfect the technique. Fortunately the occasion for serious operations in obstetric practice seldom arises, but when it does the want of a "friend in need" such as this volume would be, is seriously, perhaps irremediably felt.

Surgical Pathology and Therapeutics. By JOHN COLLINS WARREN, M.D., Professor of Surgery in Harvard University. Illustrated. Philadelphia: W. B. Saunders.

It is more than a pleasure to review such a splendid work as this latest production from the press of a publisher, who has already done so much for medicine, as W. B. Saunders. This work typographically could not be excelled, and as for the subject matter, the name of the author is sufficient to guarantee us the thorough and masterly exposition of the subject which we find within its pages. Nothing could be finer than the careful and accurate manner in which the various processes of disintegration and repair are explained and illustrated. From thoroughly scientific premises the deductions as to therapeutics seem to follow as naturally as day does night. We cannot too strongly urge every physician wishing to thoroughly acquaint himself with the modern basis and practice of surgery to possess himself of this volume. Other works from this publisher will be reviewed in the next issue.

NEW ANTITOXINE TREATMENT OF DIPHTHERIA.—(Editorial in *British Medical Journal*, 1894, ii., 771.)

We continue to receive reports from correspondents in various parts of this country of the employment of the antitoxine serum in the treatment of diphtheria. In a very large proportion of cases complete success has happily attended the method. Dr. Watkin Hughes, for instance, reports that during the present severe epidemic of diphtheria at Barnham Broom, Norfolk, he has attended forty cases; of the first thirty treated by

ordinary methods, ten died; in the next following ten cases, which were very severe, the serum treatment was used, and every patient recovered after a single injection. To obtain the best results, experience already accumulated proves that the treatment must be adopted at an early stage of the disease; but at the present time, unfortunately, there is considerable difficulty in obtaining a sufficient supply of serum. In France its preparation on a large scale has been undertaken by the Pasteur Institute, and it is hoped that in a couple of months' time the supply will be sufficient for the needs of France. The British Institute of Preventive Medicine expects shortly to be in a position to supply a considerable quantity. The treatment, however, is rapidly passing out of the experimental stage, and in the case of a disease so murderous as diphtheria, which produces annually so fearful a mortality, especially among children, the public may well look to the State to take steps to secure a constant and adequate supply of the remedy at a reasonable cost. Prof. Behring, in an address before the German Naturalists' Society at Vienna, stated that in Germany and Austria alone the mortality from diphtheria might be estimated to be about 2,000,000 in every ten years. The serum treatment would reduce this high mortality, amounting to over fifty per cent. of the persons attacked, to ten per cent., and, if employed in the early stage, to five per cent. "In other words," he added, "about 1,500,000 lives may be saved every ten years, but, of course the serum must be obtainable in large quantities. This is not now the case, and will not be the case

until the State takes the matter in hand and prepares it at the public cost." The mode in which the serum is obtained at the Pasteur Institute is as follows: The animals which are to furnish the antitoxic serum are rendered immune by the injection, under certain precautions, of the toxine of diphtheria. This toxine is formed when the virulent bacillus is grown in broth, and in practice the rate at which it is produced is increased by drawing a current of air through the culture liquid. After three or four weeks the culture is sufficiently rich in toxine to be used. The animals employed are horses in good health and previously tested by the injection of mallein, to prove that they are free from glanders. The culture, filtered through a porcelain filter, yields a clear liquid, with which the horse is inoculated by injection under the skin. Gradually, by repeated injections over a period of two or three months, the horse is brought into a condition in which its serum possesses very high antitoxic properties. The animal does not suffer in health at all, or only to a very slight degree. The efficacy of its serum having been ascertained by a test experiment on a guinea-pig, the animal is bled. It suffers little from this operation, and it is possible, if necessary, to bleed it again in two or three weeks, but it is advisable in the interval to strengthen its immunity by some further injections of the toxine. The animals used are cab horses, sound in constitution, but broken down in limb, who, after inoculation, live a life of ease and luxury, varied by a periodical phlebotomy such as our grandfathers submitted to voluntarily two or three times a year.