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AMERICAN PUBLIC HEALTH ASSOCIATION.

PROCEEDINGS AT THE EIGHTH ANNUAL MEETING, HELD IN NEW ORLEANS, DEC. 8th TO 10th, 1880.

(Continued.)

This meeting, says the *Sanitarian*, was in some respects the most important and interesting one ever held by the Association. The place and time proved to be particularly well chosen. The public authorities and the citizens, particularly the physicians, welcomed the Association with open hearts and open houses; and by their full attendance on the sessions evinced deep interest in the proceedings. The papers read, and the discussions thereon, were, for the most part, of a high order, characterized by an unusual amount of original work. To the newspapers of the city, and particularly to the *Democrat*, the Association is indebted for unusually full and accurate reports of the proceedings and other courtesies.

Dr. E. M. Hunt, of New Jersey, concluded a lengthy paper on

OUR PRESENT AND NEEDED KNOWLEDGE OF EPIDEMICS,

As follows:—The pride of modern sanitation is that it appreciates so many of the conditions on which the advance of epidemics depends, that it is able to thwart their massing for onslaught and that it is branching out in more radical

directions to see if it cannot prevent the genesis, enlistment and organization, and so arrest the assemblage of the forces for attack. We therefore have thus sought to bring into prominence the direction of thought and investigation as to these diseases, and close by summarizing the chief one in the following propositions:

I. Communicable diseases are owing to a contagium which is particulate. The contagium is not the same as to its modes of facility of conveyance in all cases or in all diseases.

II. Therefore some communicable diseases are only acquired by contact, some by the suspension of the infective particles in air or water, some by changes in the secretions or excretions after they have been sometime in contact with the air, or after avoidance from the body. Whether a contagium has any one or any two or more of these modes of ingress is a matter to be determined only by the classification of closely observed facts.

III. Some contagiums have only an origin external to the body, while others have an origin only within the body. In either case they seem to be connected with decompositions attended with extraordinary processes of a fermentive or putrefactive character. It is also possible that some diseases have an origin both within and without the human body.

IV. The development of most of the zymotic diseases is coincident with the presence of specific microzymes. Whether they are the causes of the changes occurrent or mere incidentals, and whether by changes they cause, or the food or air they appropriate, or the mechanical clogging they make in vital parts, that they mark the crisis of a disease is to be gravely suspected, but it is not yet investigated so as to be accepted as proven.

V. If, as appears, the presence of special forms is diagnostic of certain diseases, they are to be studied specifically as a means of diagnosis, as well as in their special relations to the diseases in hand.

VI. Whether any disease which is known to be derived from authenticated cases is in some instances also developed by extraordinary processes within the body or in its surroundings, can only be made certain by series of definite and classified facts accurately observed and recorded.

VII. Whether new epidemics arise from new combinations of matter incident to modern civilization, or whether there are hybrids in disease as well as in plant life, can only be determined in the same way.

VIII. There is a very hopeful study in preventive art in the direction of finding out whether we may not by preliminary treatment and a presence in the system of medicaments resistful of such fermentation and inimical to the development of these microzymes, or destructive of them in their changing state, suspend the morbid processes attempted to be instituted, and so prevent developments of disease.

IX. As there is so much differ-

ence in the way in which the same contagion affects different persons, or in their choice of persons, we have reason closely to study the bearing of individual conditions on the acquirement and development of contagions, so as to know why some escape attack and others are susceptible.

THE HON. JOHN EATON, OF WASHINGTON. ADDRESSED THE ASSOCIATION ON "SANITATION AND EDUCATION."

He said, the humane considerations in behalf of sanitation, as well as the beneficial results of sanitary efforts, should be steadily kept in view and a knowledge of them universally disseminated. What a confession was that of the English war minister that their first army in the Crimean war was lost by unsanitary conditions, and the second saved by the application of sanitary science, returning from those death-stricken regions in better health than it had ever been in barracks at home!

French military and colonial sanitation has a similar illustration. In Algeria three sets of troops had been decimated and three sets of colonists swept away by disease, but by well-conducted sanitary work the conditions were altered and a seat of health established in that settlement, the birth-rate rising above the death-rate; children were robust and healthy, and the military force in as good condition as at home. No less forcible are the illustrations brought from experience in connection with great epidemics. If it were true, as some have claimed, that the great fire of London was necessary to purify the city from the seeds of the great plague, modern sanitary applications have rendered such desolation

no longer necessary. Prof. Zidekauer, consulting physician to the Emperor of Russia, comparing the treatment of the cholera in St. Petersburg during its ravages in 1836, 1848 and 1855 with those in 1866, affirms that in the first three attacks, from 47,000 to 50,000 were struck with the disease, of whom 50 per cent died. In the epidemic of 1866 from 57,000 to 60,000 were affected with premonitory symptoms, but under the improved treatment of advanced sanitation, only about 5 per cent died. All are familiar with the fact that even among more favored conditions of society there was, a century ago, an average life of thirty years, while now the average length of life in like circumstances is fifty years.

But boards of health and sanitarians in our own country are, year by year, bringing about results which must fully vindicate the principles they advocate, as, for instance, the reported reduction of the death-rate in Michigan, and the reduction of the death-rate of infants in New York city; the general control or dissemination of typhoid fever, scarlet fever, the limitation of the yellow fever in the last year of its recent terrible prevalence; the success of the quarantine of New York city, the story of which reads like a romance. Nor should we forget manifold other results of their endeavors, such as the improvement in tenement-houses, in the drainage of soils and sites productive of consumption and malarial fevers, or the success with which they are enforcing upon architects the doctrine, in the language of Bacon, that "houses are built to live in, and not to look upon, therefore let use

be preferred before uniformity, except where both may be had;" or the regulation of abattoirs and of systems of water supply, drainage and sewage, of market inspection, the interference with the sale of adulterated and other unwholesome foods. It is to be hoped that by the aid of their sound sanitary counsels the people of Memphis, by their good sense in future municipal administration, may rejoice that their city shall be known as the city of health and not as the city of desolation.

Sanitary subjects should have a larger place in schools of medicine, engineering and architecture, that all possible may be done to advance the qualifications of experts, and to keep their art and science up to the very advance line of human acquisition. Dr. Bodwitch affirmed in 1876, after a correspondence on public or private hygiene with sixty-two of our universities and colleges, exclusive of medical colleges, that—

First—Instructions in public hygiene and State preventive medicine is woefully neglected.

Second—On private hygiene only about one-third of the colleges give any instructions.

Third—A full special course of instruction on either of the above themes is almost unknown.

Fourth—But incidentally, in connection with some other not necessarily allied subjects, these topics are treated by about three-fourths of the colleges, while one-fourth of them do not even perform this small duty in this most important matter.

The attention given to the gymnasium and the physical condition of the students at Amherst by Prof. Hitchcock is hardly duplicated in this country.

Next to our medical schools, the universities and colleges for general culture should lead the educational advance in sanitation. In England already the universities of Oxford, Cambridge and London are active. Much is expected of the new university of Victoria. Cambridge not having the legal right to grant a diploma, gives a certificate testifying to competent knowledge of what is required for the duties of a medical officer of health. The examination precedent requires:

First—A knowledge of the principles of physics and chemistry, methods of analysis, the use of the microscope in ascertaining the condition of air and water, reference to ventilation, water supply, drainage, construction of dwellings, disposal of sewage and refuse.

Second—A knowledge of the laws relating to public health, sanitary statistics, origin, propagation, pathology and prevention of epidemic and infective diseases, effects of over-crowding, vitiated air, impure water and bad or insufficient food, unhealthy occupations and the diseases to which they give rise, water supply and drainage in reference to health, nuisances and distribution of diseases.

This attention to sanitation in colleges, universities and professional schools should assure among our people of culture, in whatever profession or occupation, a fair measure of sanitary knowledge as had the learned classes in Judea and Egypt. But all this will be comparatively in vain without instrumentalities for the universal dissemination of its facts, precepts, and benefits. Here especially does education enter into the most cordial relations with sanitation. Education alone has the men and

women and instrumentalities by which this work of informing the people can be successfully and adequately prosecuted.

Dr. H. B. Baker, of Lansing, Mich., Sec. State Board of Health, read the following on

THE RELATIONS OF SCHOOLS TO DIPHThERIA AND SIMILAR DISEASES.

A disease which in one year (1859) caused in England over 10,000 deaths, in another year (1873) over 1000 in New York city, for each of two successive years in Massachusetts over 2000 deaths, which for the eight weeks ending with November 13 just passed, caused an average of forty deaths per week in the city of Brooklyn alone, and which, when once introduced into a city or State does its work year after year with varying but with certain effect—a disease which for the last twenty-three years has been gradually extending itself over the whole Northern belt of our country, and which declines only to rise again in periods of four to ten years—is a disease whose ravages are no less terrible than those of yellow fever, and which demands the attention not only of local but of State and national boards of health.

Perhaps the first question which the title of this paper will suggest to some minds may be whether diphtheria has any necessary or common relation to the schools. Bearing in mind the numerous cases on record where diphtheria has undoubtedly been conveyed from person to person, some may be ready to assume that there must be danger of spreading diphtheria if children affected with the disease attend the public schools; yet very little attention seems to have been given to this subject, and compara-

tively little has been done toward the prevention of the spread of diphtheria in this manner.

HOW DIPHTHERIA MAY BE SPREAD IN SCHOOLS.

It is not alone by the breathing of infected air that diphtheria may be communicated from child to child in school. Indeed, those who deny that the air is often or ever a medium of communication of the disease, and who are at all familiar with the thoughtless ways of little children in school, must yet recognize that the possible means of communication by almost direct contact are many. Who has not seen a schoolboy with his mouth full of marbles, just taken from a mate? Children often borrow and lend pencils, which, by instinct, they wet in the mouth or hold in the mouth; they borrow sponges of one another to wipe their slates, which they moisten with saliva. In so democratic a community as a primary school-room, it is a common thing for all the children of the room to drink from the same cup; their clothes commonly hang in close contact in closets and ante-rooms. They manifest their likes and dislikes by biting or refusing to bite from the same apple; and little girls often pledge eternal friendship by that classic symbol, "sharing gum." Though these things may occur outside the school, they are the more frequent the more children are brought together, as they are in schools.

DIPHTHERIA IN LYNN, MASS., IN 1876, AS RELATES TO THE SCHOOLS.

My attention having been attracted to a diagram in the eighth report of the Massachusetts State Board of Health, relative to diphtheria in Lynn in 1876, I was led

to study the *cause* of the rise and fall of the line indicating the increase and decrease in the number of cases. The meteorological conditions, which were carefully given, did not seem materially to have affected the course of the disease, and I was led to write to Dr. J. G. Pinkham, author of the article and diagram, inquiring at what time the schools opened in the fall. He replied that "the schools opened September 4, after six weeks' vacation." This seemed to me to explain the fall and subsequent rise of the line, as it was coincident with the closing and opening of the schools. Afterwards I wrote and inquired if there was a vacation in February or March. He replied that there was a vacation, "beginning February 29 and ending March 6." I have prepared a diagram illustrating what seems to me to be the relations of the schools to diphtheria, as it occurred at Lynn in 1876.

Starting at the month of January we find the number of cases to have been twelve. This was "almost the beginning of the epidemic." If we say the beginning of the outbreak was in December, 1875, the line would begin in that month; and I understood the winter term of school began December 6, 1875. In February there were thirty-two cases. In March there were but twenty-five, showing a decrease, owing, I think, to the vacation in the first week in March. The line rises in April to thirty cases, and in May to thirty-eight, and in June to fifty-two. There was a vacation from May 25 to June 4, but it does not seem to have had much effect in lessening the number of cases, though the number might otherwise have been greater. It is

possible there were other ways in which the children came together—in parties or meetings.

In July there were 54 cases, in August but 29. This I account for by the long vacation from July 21 to September 4. When the schools opened (September 4) the line rises to 54 cases in September, and then rapidly rises to 142 cases in October, when it drops off suddenly to 90 cases in November and to 64 in December. This drop in the number of cases may be accounted for as follows: During the month of August, during a vacation, the school committee passed the following order: "Ordered that no pupil shall be allowed to attend school from any house in which small-pox, varioloid, scarlet fever or diphtheria prevails; and no pupil having been affected with either of these diseases shall be permitted to return until convalescence is complete and attested by a regular practising physician." It is reported that this order, for some reason, perhaps from being issued during vacation, when children could not readily carry the news home, was not obeyed in every instance, perhaps not generally, and on November 28 the school committee issued a circular to the physicians asking them to help enforce the order by urging parents to keep their children away from school while diphtheria or any contagious disease was in the family. The increased effort for the enforcement of the order probably contributed much toward the decrease in exposure and consequent decrease in cases, by keeping away from school children liable to spread the disease. Another reason for the less number in November than in October may be that the attention of the parents

was strongly called to the subject by the alarming number of cases reported in October, after which many may have kept their children away from school, even when diphtheria was not present in their families, and thus lessened the number exposed to contagion at school.

The further decrease in December is but a continuation of the result of the action in October. It should be noticed, however, that the disease had become general, a large number of the children of the city had then had the disease, and consequently there was a much less number among whom it could spread. In other words, some part of the final decline of the disease must be attributed to a comparative exhaustion of the number of susceptible children.

Some of my reasons for believing that diphtheria was spread in Lynn in 1876 by the contact and association of children in schools may be summarized as follows:

1. The disease is known to be communicable from person to person; the cause which I assign is, therefore a "true cause," capable of producing the effects observed in this instance, if it was present and acting.
2. We have reason to believe that this supposed "cause" was "present and acting," there being no rule or order to forbid the attendance at school of those from families where the disease prevailed or of those affected with the disease until during the vacation in August.
3. A thorough search through all the ordinary meteorological conditions, influences connected with season of the year, the conditions of nativity, locality, sanitary surroundings, occupations, etc., failed to reveal any other as-

signable cause for the course which the disease took. It thus appears that the cause assigned is a "true cause," that it was "present and acting," and that "no other known cause was present and acting." When it is remembered that the spread of the disease began with the schools in December, 1875, slackened when the schools had a vacation in March, increased with the opening of schools in April, May, June and July, slackened when the schools had a vacation in July, August and September, increased with the opening of schools in September and October, and only slackened after the citizens had occasion to be generally alarmed, after the Board of Education had invoked the help of physicians to aid in enforcing an order to stop the spreading of the disease by the schools, and after a large proportion of the children had already had the disease—when in addition it is noticed, as is shown in the diagram which I have had prepared, that in two of the three instances the decline of the disease bears what may be believed to be a quantitative relation to the length of the vacation, I think it must be admitted by every candid and thoughtful person that the evidence is about as convincing as we usually have to base conclusions upon.

HOW CAN THE SCHOOLS GO ON WITHOUT DISSEMINATING DISEASE?

In relation to public sanitation business interests are great, but educational interests are probably greater, at least to a rising generation, which is soon to displace us. Under present imperfect methods there seems to be no escape from one of two evils—either the schools continue and spread scarlet fever,

diphtheria and other communicable diseases throughout cities and throughout States, or the schools are closed, and though the public health, which is of the greatest consequence, is furthered thereby, the whole educational work is for the time broken up.

For the best interests of the schools and for public health we need an entirely different kind of work from what we now have, a much more thorough, systematic, continuous and rational effort.

Let us consider what needs to be done in order that the schools may go on continuously and yet not spread disease.

The two most important general principles of action should be: Isolation of the sick, and complete disinfection of all infected material. In order that this shall be possible in relation to the schools of a city, it is essential to have such a thorough organization of the health authority of the city as that suspected cases of communicable diseases shall be promptly reported to the local board of health, and be immediately visited, and the truth learned, whether or not the case is one involving danger to the community. The health authority must be given money sufficient to have such work done with nearly as much promptness as the fire department displays in visiting the locality of a reported fire; and as the firemen remain until the fire is out, so the health department might have its officer or employee remain until the disease is over; he should watch and guard the public safety. He ought to use disinfectants skillfully, and, if need be, as freely as water, until all danger of a fresh outbreak should be prevented. He should see to it that in no way does

the disease spread. Now, if we do anything, we quarantine all, sick and well, by closing the schools. An active health department should at all times have as perfect knowledge of the location of cases of diseases which endanger the people under its protection as the fire department has of the buildings which are burning, and thus endangering the property under its protection. With such knowledge as this the health department could furnish the teacher of every school in the city with a list of all families in which there was a person sick with a communicable disease, and, if necessary, an agent of the health department, or some other qualified person, could act as sentry at each school and keep out persons liable to communicate disease. As an additional precaution, even where there has been no known infection, all articles likely to convey disease into the school could be easily disinfected, if it were only a custom to do so and provision were made for such disinfection. It would be easy to have a small room at every school-house where the outer wearing apparel, etc., could be disinfected and aired while the wearer was in school, instead of having, as is now so commonly the case, the clothing of all closely packed in an unventilated closet.

A SANITARY INSPECTOR OF SCHOOLS

Is needed in order to secure the best results. He should be one of the executive officers of the Board of Health, and should act with reference to general cleanliness, and especially with reference to the spread of communicable diseases. In some places it is customary to permit attendance at schools from families where communicable dis-

eases exist, and of convalescents from such diseases, on the certificate of the family physician that it is proper and safe. Sometimes the time which has elapsed since the sickness is made to determine the return to school. I think this should not be permitted, but that the Board of Health, the health officer, or a sanitary inspector of schools, should control this whole subject, and that no convalescent from diphtheria, scarlet fever, etc., should be allowed to return to school except after all his clothing has been thoroughly disinfected; and this without regard to the time which has elapsed since recovery, if the time is less than a year.

One great obstacle to progress in dealing with preventable disease in the schools, and out of the schools, is the inertia of established usages of the people and of local boards of health. In many places it has long been the custom for the successful political party to appoint a board of health, and to deny it money and other means for active work; doctors and others have accepted the situation and gone through a certain routine, which often has begun and ended with the abatement of a few nuisances, the making of a report of such feeble efforts, and then giving place to another board composed of new men from the same or from the opposite political party, which repeats the same old story. For any effective work for the prevention of diphtheria in the schools, indeed for any effective public health work, it seems essential to have a new system of selecting local boards of health, and a new system of supplying them with the necessary money to carry on their work. Permit me to suggest a plan for

the accomplishment of both these purposes as follows :

Let us suppose that the very able address recently given in this city by Mr. Edward Fenner, Vice-president of the New Orleans Auxiliary Sanitary Association, had been delivered before a "citizens' meeting" provided for by law, and officially called to consider the subject of municipal sanitation for the ensuing year, and to determine the amount to be raised by taxes for specified public health service. Let us assume that in connection with the address there had been presented carefully prepared estimates of expenditures for each item needed during the ensuing year, and that the question before the meeting had been the fixing of those amounts. The character of the attendance at the meeting might not then have been very different from what it was, though the audience would probably be larger and contain a somewhat larger proportion of persons opposed to voting large sums of money; but there would then be opportunity to meet that opposition face to face, and worthy objects would be likely to succeed. Let us suppose further that the local board of health to which was entrusted the expenditure of the money and the guardianship of the lives and health of the people of the city was of a kind essentially different from local boards of health heretofore established, that it was not an ephemeral, political body, but a permanent board made a body corporate, and selected and constituted somewhat as follows :

The board to consist of a convenient number of persons (perhaps

one or two from each ward), whose terms of office shall be such that not more than half shall go out of office at any one time; nomination to the office of member to be made by ballot at a citizens' caucus of persons belonging to the different political parties, and religiously pledged to the nomination of persons of both political parties in such a way that the board shall be equally divided politically, thus insuring freedom of the board, as a whole, from political control; the board to choose its executive officers, whose services should receive sufficient compensation to enable them to do constant and effective work. Such a board of health to prepare the estimates before mentioned, to receive from or order out of the city treasury the funds voted by the citizens and collected by taxation, equally from all classes of people in the city (because all classes are benefitted by the maintenance of public health), the board to be responsible directly to the people for its work, and unable to charge any lack of performance of duty upon any other body of men who might fail to give a Board of Health funds to do its work.

If any one supposes that this plan is fanciful and cannot be put in practice, I can assure him that it can be done and has been done for many years (about twenty-seven or twenty-nine years) with reference to a city board of education in Lansing, Mich., and certainly no one will claim that the subject of primary school education is of greater consequence than that of an efficient board of health to guard the lives of those for whom the education is provided.

DIPHTHERIA.

ITS HISTORY, ETIOLOGY, CONTAGIOUSNESS.

At the present time probably no disease is attracting so much general attention as diphtheria. The disease appears to be on the increase nearly all over the world. Severe epidemics are reported not only in foreign countries, but in different parts of Canada. The following extracts from an admirable treatise on this disease, by Dr. Jacobi, professor of disease of children, College of Physicians and Surgeons, New York, and physician to Bellevue, Mount Sarnai, and German Hospitals, first issued, will doubtless prove interesting and useful to the readers of this JOURNAL.

In the literature of the middle ages there are no proofs of the occurrence of diphtheria; still, some reports of gangrenous diseases, probably, have reference to it. Fosterus has given a fair description of an epidemic in Holland, in the year 1557. Soglia describes an epidemic in Naples and Sicily (1563) which spread, in the following year, as far as Constantinople. In Spain epidemics raged in the years 1583, 1587, 1591, 1596, 1600-1605, and 1613. In Italy the first epidemic raged in 1618; Rene, Moreau, and Bartholinas detail a large number of literary proofs in support thereof; it was characterized by its marked contagiousness and its depression of the vital powers, together with the weakness of the mental faculties left after an attack of the disease. The only autopsy, made in 1642, from a report by M. A. Severino, revealed the presence of pseudo-membrane in the larynx.

In the New England States diphtheria appeared in the seventeenth century. Samuel Danforth, graduate of Harvard University, in 1643, had twelve children. The first died at the age of six months. The "next three being attacked by the 'malady of bladders in the windpipe,' in December, 1659, it pleased God to take them all away at once, even in one fortnight's time."

John Josselyn, Gent., in "an account of two voyages to New England, made during the years 1738, 1663," writes as follows: "They (the English in New England) are troubled with a disease in the mouth or throat, which hath proved mortal to some in a very short time, quinsies and impostumations of the almonds, with greater distempers of cold." The manner in which he expresses himself shows that he does not speak of a recent invasion, but of a disease which had been common for some time.

The modern history of diphtheria may be dated from June 26th, 1821, when Bretonneau read his first essay on that subject before the French Academy of Medicine, and gave to the disease the name it now bears. It was in 1826 that the material, previously gathered, was summed up in his celebrated monograph. Since that epoch, the literature on the subject has assumed enormous proportions.

Frequent epidemics are known to have taken place in the second half of the sixteenth century over the larger part of Europe. Diphtheria of the skin and of wounds was described by Herrera in 1515. Communication of diphtheria through a wound in the finger is reported by Mercado in 1608. An autopsy was made in 1642, and the membrane found in the larynx. The suffocative, asthenic, and paralytic forms of diphtheria were described by Heredia in 1690. The first cases known in America occurred in Roxbury, Mass., in December, 1659. About that time, and mainly about 1671, the disease was very prevalent. It recurred, 1735, in New England, and never disappeared for any length of time until the beginning of this century. Samuel Bard proved the identity of all forms of diphtheria, cutaneous, pharyngeal, nasal, laryngeal, tracheal. Contagiousness was never doubted, but mainly sustained by Bourgeoise in 1823.

ON THE ETIOLOGY OF THE DISEASE.

The author refers to a careful comparison of a large number of cases of diphtheria recently reported in Massachusetts, as follows:

Diphtheria is contagious, and highly so under certain circumstances. It is also in.

fectious, although not to such a degree as scarlatina, measles, and small-pox. The other circumstances being favorable, a moist soil assists in spreading the disease, be the moisture a natural condition or brought about artificially, and particularly when the substratum is of an impermeable nature.* A positive connection between diphtheria and filth cannot be verified, although the latter but adds to the evil influence of moisture. The contamination of spring water by human excrements, and of the atmosphere of the bed-chamber by the emanations from sewers, require further study. Several reports point to septic infection by drinking contaminated water, but a final opinion on that point would as yet be premature. Cold and dampness constitute an etiological factor in children, and in individuals with a predisposition toward the disease. Yet the statements concerning wind, temperature, and weather do not allow of any definite conclusions. Other circumstances being equal, natives of Massachusetts and strangers are affected alike.

Differences in the course and termination of the disease depend on the idiosyncrasy of the individual or family, and on age and on strength. Atmospheric conditions exert an influence which is not yet thoroughly comprehended. The period of incubation, where it was possible to determine it, was about a week. In adults the disease occurred less frequently, and in a milder form than in children. The disease was seen in babes of five, seven, and nine months. As during the prevalence of epidemics of typhoid and cholera, we encounter mild fevers and diarrhoeas, so during an epidemic of diphtheria there are always a large number of inflammatory affections of the throat.

The summary of the authors on this point is as follows:—Diphtheria is pre-eminently a disease of childhood. It is not frequent

* J. G. Pinkham reports 614 cases of diphtheria in Lynn, 80 per cent. of which took place in valleys of brooks, in the vicinity of marshes, where the soil was damp and without artificial drainage. The immediate humidity of the atmosphere had no influence, however; nor was elevation of any account except in determining the condition of the soil. In all the endangered places the soil was an impervious clay.

among adults, very rare in old age. It is not frequent in the first year. Still there are, for physiological reasons, more cases before the third month than between the third and seventh or eighth. The sexes are liable to be taken in about equal proportion. Laryngeal diphtheria is more frequent in boys. Recoveries from it in girls. Diphtheria is apt to recur in those who once had it. Even membranous croup has been observed twice in the same patients. Some individuals, and even families, have a certain degree either of immunity or predisposition. Exposure and "colds" may act, but as proximate causes only. Most cases take place in the winter months in our climate, but there is no "invariable season law." "Filth" contributes to the generation of diphtheria, as it does to dysentery and typhoid fever. The question of a live origin of contagious disease in general was raised by Henle in 1840, also by Sir H. Holland and Eisenmann. Some pathologists find the morbid source of diphtheria in bacteria. "No bacteria, no diphtheria." This is not truer than that fermentation or putrefaction depend on bacteria only. The presence of bacteria in the diphtheritic blood has not been proven. There is no theoretical ground for assuming that preventing the bacteria of a diphtheritic patch from making their way through the underlying mucous membrane will, *per se*, prevent general diphtheritic infection of the system. On the contrary, the septic and putrid poison is claimed by A. Hiller as distinctly chemical. Of the same nature, viz., chemical, is very probably the poison of those of the infectious and contagious diseases in which the presence of a characteristic parasite is a recognized fact, as anthrax and relapsing fever.

MANNER OF INFECTION.

The entrance of the diphtheritic poison into the system is not the same in all cases. There are cases in which the origin of the disease is decidedly local. There are others in which the poisoning of the blood through inhalation is the first step in the development of the disease. In many cases both a sore integument and the lungs are the inlets of the poisons simultaneously. It is probable that the configuration of the vestibules of the respiratory apparatus, and the amount of active

poison, and the duration of the exposure to it, modify the intensity of the symptoms and the course of the disease.

CONTAGION AND INCUBATION.

That the contagiousness of diphtheria should still be doubted is hardly possible, and still the public act as if it did not exist. One of the latest facts is that communicated by Trammer to the annual meeting of the Illinois State Medical Society, on May 18th, 1880 (Med. Rec., June 12th). In one school district, with 59 pupils, an epidemic was started (no cases having previously existed) by two boys who visited a neighboring community where there were cases of the disease. In a few days both boys had symptoms of cold, received some domestic treatment for their little fever, and sore throat, and soon returned to school, where other pupils complained of the offensive odor of their breath. Soon other cases appeared, and the number of persons attacked was 58, with 17 deaths.

That diphtheria is contagious is beyond doubt. The contagious element is directly communicated by the patient; it clings to solid and semi-solid bodies, and in this way is transmitted even after a long time. There is hardly any disease which can cling as tenaciously to dwellings and furniture; it can be transported by the air, though probably not to a great distance, and hence in houses artificially heated, while the windows and doors are mostly closed, rises from the lower to the upper stories, and it is for this reason advisable to keep the sick on the top floor. It is certainly transmitted by spoons, glasses, handkerchiefs, and towels used by the patient. The contagious character increases directly in proportion to the neglect of proper ventilation.

In regard to the length of the incubation period, there can be no better authenticated facts than those contained in a report of Dr. Elisha Harris to the National Board of Health, an abstract of which is found in No. 1, National Board of Health Bulletin, June 28th, 1879. The report says that, in the fourth school district of the township of Newark (Northern Vermont), amidst the steep hills, where reside a quiet people in

comfortable dwellings, the summer term of school opened on the 12th of May. Among the twenty-two little children who assembled in the school-room in the glen were two who had suffered from a mild attack of diphtheria in April, and one of them was, at the time school opened, suffering badly from what appeared to have been a relapse in the form of diphtheritic ophthalmia. Besides, it is proved that these recently sick pupils had not been well cleansed, one of them having on an unwashed garment that she had worn in all her sickness three weeks previously.

At the end of the third day of school, several of the children were complaining of sore throat, headache, and dizziness, and on the fourth day and evening so many were sick in the same way that the teacher and officers announced the school temporarily closed. By the end of the sixth day from school opening, sixteen of the twenty-two previously healthy children became seriously sick with symptoms of malignant diphtheria, and some were already dying. The teacher and six of the pupils were not attacked.

SUMMARY.

Diphtheria therefore is very contagious. Both the patient and his surroundings, dwelling, furniture, towels, etc., convey the disease. In dwellings it rises to the upper stories with the current of warm air. The poison clings mostly to mucous membranes. Mild cases may communicate serious ones and *vice versa*. The period of incubation lasts two days or more. It may last a fortnight. Fresh wounds do not require so long to be affected. In these cases the supposition is, that the patient was already influenced by the epidemic. Visible symptoms of diphtheria are often noticed after the constitutional ones.

THE HYGIENE OF FOOD.

THE BREAKFAST.

The breakfast is probably the most important meal of the day. Mr. Ernest Hart writes in reference to it, in the *Sanitary Record*, London, England, as follows:—

The skilled cooking of economic materials affords a theme on which it is popularly supposed to be easy to preach, and far from easy to carry doctrine into practice. I shall speak only of the mode of preparation of the very simplest and cheapest kinds of food in the simplest and cheapest way. I shall begin with breakfast, and breakfast foods. I should like to see the tea-pot abolished from the breakfast table. I believe tea to be a drink utterly unsuited for an early morning meal, and one which has only come into general use because it is the easiest sort of hot infusion which bad cooks, careless housewives and thoughtless mothers can prepare. Breakfast should be digestible, warm, abundant, unexciting, nourishing. I am not going to quarrel with bread and butter, especially other people's. It is a typically good food, though not always presented in the most agreeable form, and far from being the most appetizing or cheapest of its class. Bread and butter, and hot cocoa, make a very good breakfast for working people, but not perhaps the cheapest they can get, or the handiest. I believe very firmly in our good English household white bread. One hears a good deal, and reads a good deal, of the waste in grinding off the outside husk, which contains nutritious gluten. The apparent economic waste is palpable enough. On the other hand, the silicated husks of all cereals is apt to be irritating. It hurries the digestion, quickens the passage of food through the intestinal tract, and I am inclined to believe that the actual physiological waste is greater in a brown bread than in a white bread diet. It is easy to take a superficial view

of this question, and superficial reformers are always wanting to turn the world upside down. The instinct which has led to the preference of white bread over brown, in places where the two can be had side by side, is nothing else than the crystallized experience which has taught people unconsciously that they are more comfortable after eating the white bread, and that the solid household bread, which is the staple food of the working classes of this country, is in the end most sustaining. A good deal is to be said in favor of some of the forms of "whole meal bread," in which the husk is partially ground off, and the inner pelticle of the grain is very finely ground, and mixed in that condition with the white flour. Moreover, it is undoubtedly a fact that under certain circumstances, in lymphatic temperaments, and in conditions tending towards scrofula, where the diet has to be carefully supervised, and in certain forms of dyspepsia, where something like mechanical excitation of the intestinal tract is useful, whole meal bread is an extremely valuable article of diet. But those are cases which I am not considering. For the working man, for the poor man, and for every day use, I doubt whether anything has yet been produced in any country of the world which is equal to the English household bread. But when we pass out of this category, and come to consider what is to be the cheap, warm, nourishing breakfast with which, at the least trouble and smallest expense, and with the greatest success, we can nourish our children, ourselves, our servants and our laborers, then we have to consider the claims of an immense class of

cereals, of which, to our shame, we make but little use in this country, and thereby suffer a great economic and hygienic loss. Wheat is a costly cereal, and it is not the most nourishing, nor does it lend itself well to those pleasant, wholesome nutritious and comforting forms of food known as porridges, which do form the staple breakfast throughout Scotland and throughout the vast American continent, which is now peopled with English, Scotch and Irishmen, and from which we have so much to learn and so much to gain. . . .

Hominy porridge is the staple breakfast of the American continent. For young people, for reasonably quiet people, for dyspeptics, for working people, for bankers and brokers, who want to keep their digestions in good order, and to be able to work satisfactorily, hominy porridge is the only food. Hominy is nothing else than a fine kind of Indian corn, ground roughly and largely like Scotch oatmeal, and the way to make the porridge is to soak it in cold water all night, and to boil it for half an hour in the morning, stirring it frequently to prevent it from burning. When boiled, each grain should be soft and separate, like well boiled rice. It should retain its opaque whiteness, and should not be watery or semi-transparent, or else it may be known to be over-cooked. Neither should it run into masses, or coagulate in lumps; all these are the indicia of bad cooking. They may be easily avoided, and hominy which does not come up to table with every grain soft and separate, and showing a pure, opaque, pearl-like whiteness, should be sent down again and devoted to some other use, such as frying in slices. When

served in a hot bowl (with a pile of hot plates), it is best eaten with milk and sugar by the luxurious. To children and simple minded people it is delicious with skim-milk and treacle, and of all the cheap, wholesome, digestible, delicious breakfasts which the world affords, I do not know any which can compare with a dish of hot hominy with skim-milk and golden syrup. It would delight the heart of any British child. There is no epicure who retains a palate capable of appreciating simple purity of flavour, or a mind capable of appreciating the best gifts of nature prepared for gastronomic enjoyment, who will not find in such a dish of hominy one of the most perfect luxuries which could be put before him. I should like to hear that some of the royal children take hominy, skim-milk, and golden syrup every morning for breakfast. It would make it fashionable, and such a dish requires only to be fashionable in this country in order to become universal, and to be as popular in the palace as in the peasant's cottage. One practical inconvenience is sometimes found in preparing porridge, and that is the necessity of steeping the hominy over night, and spending half-an-hour in boiling it in the morning

MICROGERMS AND ZYMOTIC DISEASES.

In a very interesting article recently published in the *Journal d'Hygiene*, by Dr. Marie Davy (*Sanitary Record*), some important results of experiments made by M. P. Miquel are given at some length. As the results of the experiments, he says that the spores of cryptogams, and the microgerms of bacteria, obey different laws as

regards their diffusion in air; that whilst both have a tendency to increase during warm weather, the former are more rapidly developed when the air is moist, whilst the latter (microgerms) increased chiefly when the air is dry, and decrease when it becomes moist. Also, that whilst an exceedingly small minority only of microgerms can be suspected of being injurious, the greatest proportion are certainly innocuous to man. In this opinion, at any rate so far as microgerms contained in water are concerned, he is in accord with the opinions expressed by Dr. Saunderson in his work on the *Origin and Distribution of Microgerms in Water*.

M. Marie Davy thinks that during the winter months comparatively innocent bacteria are chiefly found in the air; but that in spring new kinds of bacteria enter on the scene. The results arrived at are—1st. That the odours which accompany certain emanations are no characteristic sign of their hurtfulness; for instance, sulphuretted hydrogen in small quantities, and the empyreumatic vapours given off by burning animal matters are not "miasmatic." 2nd. That humidity of soil is an efficacious obstacle to the diffusion of hurtful germs, whilst dryness favours their growth. 3rd. That dry rubbing, sweeping, and dusting apartments or public places, aid in the diffusion of germs that may have been deposited there. He therefore recommends lime-whiting of walls, and washing all other substances where water can be used without injury to the article to which it is applied.

In a later number of the *Journal d'Hygiene* there is a short notice of the last researches of Professor T. Cordeli, of Rome, on the *Bacil-*

lus Malariae, from which it appears that he has been successful in discovering, after long search, bacilli containing spores, which he considers settles the point as to the propagation of these microscopic bodies in the earth. Also, that this discovery accounts for the occurrence of marsh malaria, and consequent fever in those exposed to infection, in places not inhabited either by man or any other animal capable of contracting malarial diseases. He believes, in common with Professors Klebs and Marchiafava (who has found the *bacillus Malariae* in the blood of three patients during the cold stage of malarial fever), that these bacilli are the specific agents of malarial disease. We may also mention the presence of the *bacillus anthracis* in the blood of persons who have died from Woolsorter's Disease, which shows that this disease is either caused by or gives origin to this microgerm. The presence of living bacteria in the fresh discharges of cholera patients, discovered by Dr. Hassall many years since, and also in cases of summer diarrhoea, which have been noticed by several observers, as well as in numerous cases of poisoning by dripping reported by Dr. Tripe, show that there is a large field of observation open to those who feel inclined to make additional investigations in this branch of medical science.

Prof. Klebs, of Prague, and Prof. Tommasi, of Rome, have been examining into the poison which produces marsh fever. The former has, in a recent number of the *Zeitschrift*, given full particulars of the experiments made and the results obtained. These investigators examined the lower strata of the

atmosphere of the Agro Romano and its soil. In both they discovered a microscopic fungus, consisting of movable shining spores of a long oval shape, about nine micro-millimetres in diameter. With these spores animals were artificially infected with intermittent fever of the true marsh type, and they showed precisely the same enlargement of the spleen as human beings who have caught the fever in the ordinary way. Messrs. Tommasi and Klebs have given this fungus the name of bacillus malarix, as it grows into the shape of small rods.

TYPHOID FEVER AND CITY WELL WATER.

As illustrating the danger of using well water in cities, the following, reported by Dr. Stoddard, of Rochester, in the "Transactions of the Medical Society for the State of New York," is valuable:—

A certain limited portion of the city was invaded with the typhoid fever, while other parts of the city were exempt from the disease. Examination limited this area to about five acres. In the centre of this district was situated a well, the surroundings of which were very filthy. About 30 feet from the well was a privy, and the drainage from this was towards the well. On opening the well, the water was found free and clear from odor or taste. On microscopical examination, nothing unusual was found, and chemical examination disclosed little else of importance, besides a considerable amount of sodium chloride. The presence of the sodium chloride pointed to sewage pollution, as proved to be the case. To test the influence of the water upon those

using it, a thorough census of all the families in this district was taken, the number of persons using the water ascertained; also the number using water from any other source, and the cases, character of illness, and deaths, which had occurred during the previous six months, with this result:—87 families, consisting of 492 persons, occupy the district. 40 families, comprising 249 persons, *use water from this well*. Among these occurred 23 cases of typhoid fever, and one of diphtheria, during the period taken. 47 families, of 279 persons, *did not use the water*. Among these occurred two cases of fever during the same period! Among those using the water, the ratio of sickness was 1 in every 9.12. Among those not using the water, 1 in 139.5. It was ascertained that the first case of typhoid in the district occurred in the family occupying the premises on which the well was located. The well was immediately closed, and not another case of typhoid had appeared after two months in this section.

There are many wells in Toronto, thousands of them in Canada, the surroundings of which are "very filthy." It can be surmised what would be revealed by a thorough census of those using the water.

TYPHOID FEVER AT LENNOXVILLE GRAMMAR SCHOOL.

There have been outbreaks recently of typhoid fever at the Grammar School, Lennoxville, near Sherbrooke, Que. Drs. Osler, Cameron and Simpson, of Montreal, have been requested it appears to make an investigation as to the cause. The following in reference to the outbreaks is from

a communication in the *Canada Medical and Surgical Journal*, from Dr. E. D. Worthington, of Lennoxville, and is instructive.

"For many years" he says, "that school has had a most unenviable, as well as a most painful reputation, as the centre of a panic, in some form or other. It is the only school in Canada, that I know of, that has struggled through such a wretched experience. There must have been some counterbalancing good in it to have enabled it to retain its vitality. It is unquestionably a magnificent school, both for the development of mind and muscle; but it is a reproach to those in charge of it, that an implacable enemy, living on its grounds, or within its walls or wells, should not have been wiped out of existence years ago. I mean that "contagium vivum," that much abused, and now much talked of typhoid fever germ.

Last summer, just before the outbreak of fever, when the accumulated filth of a drain, that was not a drain, and extended only a short distance beyond the foundations of the school, rendered the air offensive, by backing up its horrid stench into the building, and it became necessary to do something, what was done? The most dangerous thing that could have been done! An enemy that had been a source of dread for years! Incredible as it may seem, this horrid thing was actually opened in term, in the heat of the summer, under the windows of school and college, and close to the public highway, just before the close of the term.

When the hotbed of disease was opened, it was found for the first time, that this particular drain had no outlet, and that it terminated

almost under the dining-room, used in common by both grammar school and college. We all know what followed. Whether what followed was the result of the opening of that drain, at that time, God knows. But it was an indiscreet act, one involving an utter disregard of the first principles of public health, and common decency, on the part of men in charge of a large public school. Either that drain should have remained untouched for another week, or, the boys should have been sent home.

Some seven or eight years ago, from causes similar to those at present existing, Drs. Robertson, Johnstone, and myself were requested to examine and report upon the then state of things. After going over the college and school buildings, we found everything in the most admirable order. Going over the grounds, however, we found a huge privy, used in common; and I have, no hesitation in stating that that, privy was the filthiest thing I ever saw, utterly disgraceful. So sickening was it, that one of the medical commission retired in haste, with a result that may be guessed at.

That privy was unanimously condemned, and it was suggested that as the water supply was obtained from a well within a suspicious distance from the privy, the water should be sought for from some other source, and that the water of that well should not be used under any circumstances for cooking or drinking. The privy was immediately closed. The well has continued to be used *hinc illa lachrymæ!* How this privy was closed up—whether the latrine was first emptied and the hole filled

up, or the hole covered over with earth—I do not know; nor do I know the exact distance of the old latrine from the well, but at a rough guess, I should say that the south angle of the rear of the present school building, the well and the site of the old latrine would form an angle whose sides would be about 60 feet. The latrine was a large hole, without outlet, and the well being a deep one, both being in a light sandy or gravelly soil, nothing could be more favorable for percolation from the latrine to the well. The water in that well still has its friends, and it cannot be denied that its appearance is rather prepossessing; but at times I have known that water to *stink*—but with a wonderful fertility of resource, whenever it did so stink, it was found that some harmless frog was “at the bottom of it,” and then there were congratulations and renewed confidence in the water.

I doubt very much if that well should be regarded as a “spring,” or other than a deep hole for the collection of surface drainage. Now, as this privy had been in use for many years before by a large public school, it is quite fair to infer that the soil in its neighborhood was fully saturated with a source of every-day danger, and no spot in the neighborhood more than this well, which, from its depth, rather courted contributions, and thus became, in my opinion, a very magazine of disease and death.

So satisfied was I that the well was always the dangerous thing, having two boys at the school, as day scholars, I emphatically ordered them never to drink of that water.

DISEASES WHICH SEEM ON THE INCREASE.

In an address delivered at Edinburgh, Scotland, in October last, by Dr. Beddoe, President of the public health section of the National Association for the Promotion of Social Science, and published in the *Glasgow Sanitary Journal*, is the following:—

Leaving now the consideration of diseases which, like small-pox, are diminishing, let us turn to such as are becoming more common and more formidable. Of most of these the increase is supposed to be attributable to the greater complexity and struggling character of life, the increase of hurry and worry. They are chiefly affections of the heart and of the nervous system, and the change for the worse is notable especially in men—men in the autumn and summer of their lives—as Mr. Welton has shown in more than one statistical paper. I should have been tempted to enlarge on this part of my subject, had it not recently been handled with so much ability by Dr. Crichton Browne, in his address on Psychology to the British Medical Association,—an address the whole of which, but especially that part which deals with the principles of education in relation to cerebral physiology, I take the liberty of commending to your perusal. Dr. Crichton Browne is of opinion that not merely the nervous temperament but the neurotic diathesis is on the increase among us, and that the growth of actual insanity, which official statistics affirm, is not merely an affair of figures, of laws, and of estimation, but an actual fact. In this opinion he is backed by that accurate observer and cautious rea-

soner Dr. John Sibbald, and to it I am inclined to adhere.

TO AVOID INFECTION.

Dr. Littlejohn, Medical Officer of Health, Glasgow, Scotland, gives the following rules to ensure immunity, as far as possible, from infection, by those who are obliged to visit or attend upon the sick, as physicians, nurses, &c. :—

1. Never to visit the houses of the sick—fasting.

2. To insist that the ventilation of the apartment to be entered is as free as possible. For this purpose, during the visit, the window must be raised, and the door kept open. Such a procedure exposes the patient to no risk; and, at the same time, the special poison of infection is so diluted as to be practically innocuous.

3. To remain in the presence of the sick no longer than is necessary.

4. Afterwards, free exposure to the open air sufficiently disinfects the clothing; but during epidemics, when there is a large amount of sickness, the clothes worn during the day should be exchanged for others before mixing freely with other persons.

5. And, in these circumstances, free ablution of the hands, aided by the use of such a disinfectant as Condy's fluid, is absolutely necessary.

[It is advisable too for the attendant, when in the sick room, to keep on that side of the patient from which any current of air comes, as from an open window, so that the current shall be from attendant to patient, and not from patient to attendant. ED. C. H. C.]

CONSUMPTION IN COWS.

On the authority of the *London Medical Record*, Dr. Heath, president of the American Farmers' Club, recently read a very important paper before that society on the tuberculosis in domestic animals, and some of its effects on human health. He says that this disease prevails extensively among such animals all over the world, and especially in populous and crowded localities. Cows which are kept shut up in close, foul air, as is the case with large numbers in and about London, are very liable to it. He says that observations in Mexico have led to the conclusion that thirty-four per cent. of all beasts slaughtered there are more or less affected with this disease, and he is of the opinion that fifty per cent. of the cows kept in large towns are thus diseased. The fact that this is not more generally recognized is of course owing to the animals being slaughtered before the disorder has attained any very noticeable development. According to Dr. Heath, if cows, like human beings, were allowed to die from natural causes, the proportion succumbing to tuberculosis would be quite as great, and probably much greater.

TOBACCO POISONING.

We have always believed that there is some good in alcoholic spirits, but could never discover any in tobacco.

A case of sudden death from chronic tobacco poisoning is reported in the *Pacific Medical and Surgical Journal*. The man was about 44 years of age, had been 18 years engaged in the manufacture of cigars, and had smoked cigars a great deal. He died while

in a carriage on his way to a drug store, just after having consulted a physician.

Dr. Wm. O'Neil reports in the *Medical Bi-Weekly* a case of a woman who nearly lost her life by poisoning from an application of tobacco to a wound to stop bleeding. When found she was unconscious, and would doubtless soon have died, had not the doctor discovered the cause and removed the tobacco. Applying tobacco to wounds is a common practice, and ought to be entirely abandoned.

An eminent English physician says, I know of no single vice which does so much harm. It is a snare and a delusion. It soothes the excited nervous system for a time, to render it more irritable and feeble ultimately. I believe that cases of general paralysis are more frequent in England than they used to be; and I suspect that smoking tobacco is one of the causes of that increase. I believe if the habit of smoking advances in England as it has done for the last ten years, that the English character will lose that combination of energy and solidity that has hitherto distinguished it, and that England will fall in the scale of nations.

The celebrated Frenchman, M. Gambetta, says *Good Health*, has been a great smoker, but has recently been ordered by his physician to abandon the habit. A Paris correspondent says that all the tough old Frenchmen still in enjoyment of unimpaired mental faculties never smoked. M. Dufare, M. Barthélemy, St. Hilaire, Victor Hugo, M. Etienne Arago (brother of the astronomer), belong to the non-smoking school of public men. So did M. Thiers, M. Guizot, M.

M. Crémieux, M. Raspail, and the octogenarian Comte Benoit d'Azay.

Mr. Solly, surgeon to St. Thomas Hospital, writes: In the course of my practice I have met with many individuals who, like myself, have abandoned smoking because they thought it did not agree with them. I have never found one who does not assert, most positively, that he has better health since, and that his intellectual activity has been improved.

The editor of this JOURNAL has persuaded quite a number to abandon the habit of using tobacco; and not one of them but found much comfort and benefit, physically and mentally, from so doing.

INSANITY AND BODY-WEIGHT.

That a state of reduced health and nutrition is associated with insanity, says the *Medical Times and Gazette*, either as a cause or concomitant is shown very clearly by a table appended to the recently issued report of the Royal Asylum at Montrose, setting forth the weight on admission and discharge of those patients who recovered during the past year. Of those patients, 45 in number, only 4 lost weight during treatment, being lighter when they left than when they entered the Asylum. The other 41 patients gained in total weight 565 lbs.; or over 13½ lbs. each. It thus appears that during the process of recovery these 41 patients made an amount of new living tissue equal to about four adult human bodies of average weight. The greatest gain in any one case was 67 lbs. in a female, who increased from 67 lbs. to 130 lbs. in weight in a period of two months. She was labouring under mania

when admitted, and must have been exhausted and emaciated in an unusual degree. The least gain recorded was 1 lb. in a period of one month. As might have been anticipated, the increase in weight during recovery was much more decided in cases of mania than in those of melancholia. The former involves rapid wasting; the latter is most frequently associated with such impairment of nutrition as is seen in anæmia.

THE QUALITY OF INFECTION.

The following sensible remarks appear in a little pamphlet by Dr. David Page, of Edinburgh. (*Mich. Med. News.*) Infectious diseases exhibit widely different degrees of severity, but it is well to bear in mind that the slightest and most incipient degree is as intensely infectious as the most alarming and developed, and that the same unrelaxed precautions are required for the one as for the other. Mildness of attack is only a matter of good fortune to the sick person thus attacked, and gives no security whatsoever to the healthy.

Do not forget that infection is a quality of the fever poison, and not altogether one of dose or length of exposure. The mildest case and a moment's exposure may give the infection and the disease in its most malignant form, the issue depending upon the state of the individual and his sanitary surroundings at the time, in other words, *the seeds of infection are always the same, the result depending upon the soil in which they happen to be sown.* I have known some of the worst and most fatal outbreaks of scarlet fever to have been preceded in the affected households by the mildest possible attacks.

Children are the great nursery of infectious disorders of all kinds, but it is a most mistaken notion to look upon these disorders as ailments which children are bound to have.

No child is bound to have scarlet fever or diphtheria; not even measles; and to have any one of these diseases points to bad hygienic conditions, and generally to some one's ignorance or neglect.

MICHIGAN STATE BOARD OF HEALTH.

REPORTED FOR THE "CANADA HEALTH JOURNAL."

At the regular quarterly meeting of this Board, on Tuesday, January 11th, 1881, in Lansing, and after a report of some experiments in ventilation, Dr. Kedzie stated that in conversation with the newly-elected Governor of the State, he had seemed to appreciate the work done by this Board, and, in his message to the Legislature had recommended an

ADDITIONAL APPROPRIATION OF \$2,000 for the uses of the Board. Mr. Parker, committee on legislation in the interests of public health, reported in referenee to laws requiring expert inspection of public buildings constructed or in course of construction, and also on a proposed system of inspection of steam-boats and other sailing vessels on our many inland lakes and streams, at summer resorts, &c.

A sample of apple jelly was sent to the secretary, with the statement that eating of the jelly had caused the sickness of a large family. Dr. Kedzie had analyzed it, and found three grains of sulphate of zinc to each ounce of the jelly; probably formed by the action of the acid of

the fruit on the galvanized iron vessel in which it was boiled.

“HOG CHOLERA.”

The secretary read a letter from Dr. Jerome, of Saginaw, stating that he saw hogs suffering with this disease, which were unable to go up the inclined plane at the slaughter houses in Chicago, killed and made into lard, and stamped with a fancy brand. In this same connection, Dr. Baker spoke of lard which caused severe sickness in a family in Lansing. A sample of it had been microscopically examined by Dr. Detniers, of Chicago, who sent drawings of the organisms he found in it, stating they were the same as he had found to be the contagious principle in “hog cholera.” He also read a letter from Dr. Marshall, of Lansing, which said he had examined a sample of

the lard in which the “fried cakes” (eating of which caused the sickness) were cooked, and had found the same organisms to be present. Dr. Baker also read a part of a letter from Prof. Klebs, of Prague, Austria, relating to the same subject. Prof. Klebs has made a special study of such subjects, and claims to have found the organism which is the specific cause of typhoid fever. He does not think hog cholera to be the same as typhoid fever, but would like material with which he could carry on a comparative study.

Dr. Baker stated that

CONTAGIOUS DISEASES PREVAIL MOST where it was noticeable that the local authorities paid little or no attention to the laws requiring the appointment of a health officer, and communication with this Board.

PUBLIC HEALTH STATISTICS IN ONTARIO, 1880.

Showing the total number of deaths, and the number from the twelve principal causes, in the cities and largest towns, twenty in all.

	Population in 1879 as returned by the Assessors.	No. of Deaths returned in the year 1880.	Ratio to 1,000 of the Population.	Diphtheria.	Dysentery.	Diarrhoea.	Typhoid Fever.	Scarlet Fever.	Other Fevers.	Consumption.	Brain Disease.	Heart Disease.	Pneumonia.	Lung Disease.	Old Age.
Toronto	73813	1510	20	29	6	65	35	11	...	149	31	63	10	46	31
Hamilton	34968	592	18	1	16	13	18	3	47	18	18	18	63	16	18
Ottawa	24015	562	33	2	8	2	5	6	60	21	15	15	17	5	17
London	19666	393	3	2	9	3	12	2	29	5	15	22	22	6	6
Kingston	14358	299	...	3	5	4	4	1	43	11	7	7	8	15	15
Brantford	11587	196	...	5	6	1	19	...	26	4	3	12	4	6	6
St. Catharines	10475	183	...	1	2	2	9	18	4	19	4	10	18	6	6
Guelph	10072	123	...	2	2	4	...	1	15	5	5	3	7	13	13
Belleville	9799	183	...	2	1	...	...	18	3	15	4	7	11	14	14
Stratford	8685	87	...	5	2	1	2	3	6	6	4	4	2	2	2
Chatham	7672	125	...	6	2	3	5	2	6	17	3	2	1	4	4
Brockville	7468	107	...	4	4	6	1	...	8	4	4	2	5	1	1
St. Thomas	7317	75	...	1	2	5	2	2	5	5	2	2	6	4	4
Peterborough	6606	78	...	1	8	3	...	3	1	7	...	2	4	3	3
Windsor	6082	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lindsay	5521	48	...	...	...	1	3	...	...	3	...	2	4	...	3
Port Hope	5330	53	...	2	...	2	...	1	...	7	2	1	4	1	1
Cobourg	5173	64	...	2	2	1	1	1	...	6	2	6	2	3	3
Woodstock	5123	61	...	6	2	...	...	1	...	10	2	5	4	1	1
Barrie	4818	61	...	7	...	1	1	1	...	5	6	2	3	...	6
Parkdale	1000	12	...	...	...	...	...	...	...	1	...	1	2	...	...
TOTALS	276,838	4796	17.7	183	84	135	85	120	28	484	126	176	311	144	126

Not being able to obtain the population in 1880 we have not given in the above table the number of deaths per 1,000 living, excepting in the totals, in which Windsor is omitted. The four largest cities—excepting Hamilton,—Toronto, Ottawa, London and Kingston, give a return of about 20 or over per 1,000; Ottawa giving about 22, and returned 75 deaths from small-pox. Hamilton returns about the average only, 17, per 1,000. Brantford, St. Catharines and Belleville return a little less than the average.

Editor's Special Corner.

OBTAINING MONEY UNDER FALSE PRETENCES.—Is it anything more or less than getting money under false pretences, this practice of selling patent medicines to cure a long list of diseases, which the vendors of the stuff know very well will not accomplish one-tenth part of what is promised in the advertisements? Doubtless convictions might be obtained in many cases of sale of these medicines, if parties interested (and who is not? the State certainly is) would undertake it. This would soon lessen the evil. An exchange says "The *Medical Record* has been reading the quack advertisements in eleven of the religious journals, and finds fifty false assertions regarding the efficacy of quack remedies . . . The place in which to attack the evil is in the religious journals themselves. Doctors, to a man, are agreed as to the aforementioned evil. The people, including the clergy, are utterly ignorant in the matter. They need light. Who will give it to them?"

LICENSING PLUMBERS.—Many are now of opinion that plumbers should undergo an examination and procure a license before being allowed to do plumbing work. There can be no doubt about the necessity for a system of licensing in plumbing work. In Montreal a sensible and practical movement has been inaugurated by the plumbers under the water-works department, with a view to have better and more substantial work executed in connection with the drainage of dwelling-houses. It is intended to have the qualified plumbers formally authorized by the corporation and their names published for the information of the citizens. The *Sanitary Engineer*, January 15, 1881, says in reference to this question: "There has been a great outcry because a number of people lost their lives at the burning of the Madison Street tenement house through the alleged carelessness or ignorance of a plumber. The fact is, that many more lives than were here lost are sacrificed every week through the ignorance and carelessness of men called plumbers, and yet some people

doubt the propriety of attempting to legislate to control those who work at this trade. More bodily injury is caused in New York city alone from defective plumbing than is produced in the whole United States from steam boiler casualties, and yet engineers must be licensed, and plumbers are free from any control."

THE MEDICAL PROFESSION AND THE PUBLIC HEALTH.—The profession is evidently thoroughly awakened to the importance of State medicine, and to the loss the country is sustaining through sickness and deaths, much of which the State, through the Governments, might prevent. We need hardly say we are much gratified at this, which we have reason to look upon as, in a large measure, the fruit of our own labors. In this number we have only time and space to notice that, on 26th January, in the Local House, all the medical members met together and appointed a committee of their number, consisting of Drs. Baxter, Boulter and McMahon, to urge upon the Government the desirability of taking early action for the promotion of the public health in this Province; and that on the 27th a deputation, consisting of Hon. Senator Dr. Brouse, Dr. James A. Grant, of Ottawa, Dr. Canniff, of Toronto, Drs. Strange, M.P., and Bergin, M.P., and Hon. Senator Dr. Almon, and others, waited upon Sir John Macdonald and Sir Charles Tupper in reference to the Sanitary question, as relates to the Dominion. The Ministers expressed their interest in the question, and promised to give it their consideration.

IN THE SENATE, on January 25th, Dr. Brouse moved for copies of all resolutions from medical conventions asking for health legislation. He spoke at considerable length, advocating the establishment of a central bureau of health and vital statistics, and quoted statistics of other countries to show the advantages which had resulted from similar legislation elsewhere. Dr. Paquet, in French, seconded the motion, and thought that a Minister of Public Health was as necessary as a President of the Privy Council. The motion was agreed to.

IN THIS CONNECTION we desire to express our pleasure that Dr. Grant, of Ottawa, is, we learn, about to be called to the Senate. He has manifested much interest in the Public Health question, and in the Senate, with Dr. Brouse, the public may hope for much assistance being rendered in the advancement of this important work.

LENGTH OF SCHOOL PERIODS. — How many hours shall children attend school? Mr. Chadwick, our best authority (says the *Detroit Lancet*), concludes that a child from the age of five to seven can attend to one subject for fifteen minutes; from seven to ten, about twenty minutes; from ten to twelve, about twenty-five minutes; from twelve to sixteen or eighteen, about thirty minutes. The total mental work daily suitable for a young person from twelve to sixteen years of age is placed at from five to six hours.

DIPHTHERIA AND CROUP are now believed by many, amongst whom are Jenner, Jacobi, Thursfield and Mackenzie, to be identical, and that they are one and the same disease. Flint, Oertel, Cohen and others still believe in the duality of these affections.

MAKING COFFEE. — Trousseau's Therapeutics teach that the effects of coffee vary according to the way in which it is made. When boiled with water in a closed vessel, we obtain the caffeine principally, and only part of the caffeine. Coffee made in this way is exciting. That which is made by boiling in an open vessel, by which the oily stimulating ingredients of the berry are permitted to escape, lessens tissue expenditure and gives support to the system without much stimulation and excitement.

DIPHTHERIA IN RUSSIA.—A terrible epidemic is prevailing in parts of Russia. The measure that has been found most efficacious in arresting the spread of the disease in Poltava, has been the fumigation of infected premises with burning sulphur. The peasants, supported by the priests, object to this process. "Cure the sick, if you like," they say,

"but what have our houses to do with sickness?"

WHEN WE REFLECT on the stupid credulity of men in relation to medicine, says the *St. Louis Clinical Record*, we ought not to be so much astonished that there are so many charlatans as at the fact that there are still so many honest people among the doctors.

THE MORALITY OF MEDICINE.—The criminal statistics of Brooklyn for the past year show that 25,906 arrests were made by the police. One was a clergyman, one an editor, eight were artists, six actors, two customhouse officers, *forty-seven lawyers* (!), and eleven undertakers; but not a physician was there in the lot.

FOOD VALUES.—Professor W. O. Atwater, in an essay on the nutritive value of fish, gives the following table. Taking medium beef at 100, we should have, as the nutritive value of like weights of fish free from bone; Medium beef, 100; fresh milk, 23.8; skimmed milk, 18.5; butter, 124.0; cheese, 155.0; hen's eggs, 72.0; codfish, fresh, 68.0; flounders, 65.0; halibut, 88.0; lake trout, 91.0; eels, 95.0; shad, 99.0; salmon, 104.0; salt mackerel, 110.0; dried codfish, 346.0.

A MILK DEALER at Leeds has been fined £5 at the police-court for not keeping his dairy properly clean, as required by the Act of 1871.

RESUSCITATION AFTER TWO HOURS AND TWENTY MINUTES.—R. I. M. Coffin, F.R.C.P., Edinburgh, writes to the *British Medical Journal*, that, on September 12th, 1877, he was called to a lady in labour in South Kensington, and found that her child had been born nearly an hour. Though there were two married women in the room, the child had been allowed to turn on its face, and so became asphyxiated. He found a slight flutter at the heart, which ceased in a few minutes. The child was partially wrapped in flannel and placed in front of the fire, whilst he adopted Dr. Sylvester's method for suspended animation. After a little more than an hour it gave a catching kind of sob. He persevered, and at the end of two hours and twenty minutes the child breathed perfectly; and has grown to be a fine healthy child.

SUPPLEMENT.

COST OF SICKNESS AND DEATHS IN CANADA.

STARTLING FACTS AND FIGURES.

The strength of a nation cannot be correctly estimated simply by numbering its inhabitants. The health, vigor, and ages at death, of the people must be taken into account.

For example, according to the statistical year-book of Austria, in examining recruits for the army, the proportion of 'fit' to 'unfit,' or accepted to rejected, is as nearly as possible as *three to seven* in that country; while the British army medical report shows the proportion of 'fit' to 'unfit' of recruits examined as *two to one*. As to the causes of primary unfitness, 'muscular tenuity and debility' in the Austro-Hungarian conscripts prevailed to the extent of 281 per 1,000; while of English recruits only 56 per 1,000 were incapacitated thereby, even with the addition of impaired constitutions. In Austria 'disease of joints' (probably of a scrofulous character) incapacitates 106 per 1,000, while less than 10 per 1,000 are refused in England from this cause.

In Norway, a highly favored country in this regard, about 25 per cent. of those who are born die before reaching maturity, or the age of 20 years. In England and the United States about 35 per cent. die before reaching that age. In Ireland 51 per cent. die under 20 years of age. In Ontario, of those who were registered in 1877, only a small fraction less than 50 were under 20 years of age at death; and in 1878 48.5 per cent. were under 20.

Political economists in England, Germany, and United States estimate the value of a mature man, aged 20 years, on an average, at \$1,000; or as costing \$50 per year—for feeding, clothing, educating, &c., for 20 years, before becoming of service to the State. All that die before 20, then, would represent so much clear loss.

If we estimate the death rate in Canada at 20 per 1,000 living per annum—in some of the cities it much exceeds this; in Massachusetts it is 22½, and in England 21 per 1,000—we have in this country, if this estimate be not too high, in a population of 4,000,000, in round numbers, not less than 80,000 deaths per year. Or in Ontario, with say 1,500,000 inhabitants, 30,000 deaths. Over 20,000 were registered in this Province in 1877; and it is thought that not more than 66 per cent. of the totals were recorded.

If 35 per cent. of these, as in England and United States, instead of a proportion of nearly 50 per cent. as the returns in Ontario have shown, die before reaching 20 years of age, there are in Canada 28,000 deaths, and in Ontario 10,500 deaths, every year, of those who have not reached the full working period, but who have been sustained out of the income of the country, each for a certain number of years. A large proportion of these die under one year, many of the remainder under five years, and so on. It was found that in Massachusetts during seven years, 1805 to 1871, inclusive, over 81,000 died at ages under 20 years, and that the average age of each of these was 3.6 years. It the 28,000 who die every year under 20 years of age in Canada, die at

about the same age as those who died during the seven years in Massachusetts under 20 years of age, they would live in all over 100,000 years— $25,000 \times 3.6$. These, at \$50 per year, would involve a money loss of \$5,000,000. Or for Ontario alone, a loss of \$1,890,000.

Now as to the loss during the working or productive period, from 20 to 70 years of age. If all who lived to be 20 lived on to be 70 years old, each would of course give a productive period of 50 years; but as some die at 25, some at 30, some at 40 years, and so on, the average falls short of 45 years each. In Massachusetts it has been found, on careful estimates, to be considerably less than one half, and that the loss in productive years was considerably over one half; or as 16-81 is to 36-36. Let us estimate, however, that in Canada all who live to be 20 years old live, on an average, to be 45; that is live to labor 25 years, losing only 25 years. In Canada, of the 80,000 deaths estimated to take place every year, 28,000, as estimated, or 35 per cent., die under 20 years of age, and about 77 per cent., on an average, of the remaining 52,000, it is estimated, die before reaching 70 years of age; or, in other words and figures, 40,000, in round numbers, die between 20 and 70 years of age. These 40,000 work or labor only half, at most, on an average, of the 50 years, by reason of deaths; each losing at least 25 years, representing a loss to the Dominion of 1,000,000 years of labor— $40,000 \times 25$. Estimating each year of service to be worth to the Dominion \$300—less than \$1 per day, there is a loss by reason of deaths taking place during this period of life, of \$300,000,000 per year— $1,000,000 \times 300$. Or in Ontario alone, on the same estimate, of \$112,500,000 per year.

But this is not nearly all; we must consider the loss by, and expense of, sickness.

From records of various Benefit Societies in Great Britain and Health Assurance Companies in the United States, it has been found that for every death there are two constantly sick; or in other words, there are 730 days of sickness for every death in the year— $365 \text{ days} \times 2$ —; and days, too, of actual inability to labor, the lesser ailments not being included. Take, for example, 10 cases of typhoid fever, one of the severe and common diseases of this country, each patient will be sick or incapacitated from labor at least 30 days, probably, if not more, on an average, representing 3,000 sick or lost days; while perhaps not more than 4 or 5 of the cases may prove fatal. Some statisticians estimate from 19 to 20 days of sickness per year for every individual, which would give a much greater sickness rate than the first-mentioned estimate.

Taking the lower estimate as correct, there would be in Canada every year 58,400,000 days of sickness— $80,000 \times 730$; costing probably, on an average, for nursing and doctoring, not less than \$1 per day, a low estimate or \$58,400,000. For Ontario, \$21,900,000.

But besides this, 40,000 of the 80,000 persons die during the working, productive period, and therefore there would be 29,200,000 days of labor lost, in the Dominion—or $40,000 \times 730$; worth on an average \$1 per day, and representing a loss of \$29,200,000 to the Dominion; or to Ontario alone of \$11,250,000.

The above, then, represents a total loss to the Dominion through sickness, and what we may term premature deaths, of \$388,600,000 per year; and to Ontario of \$147,540,000. And this, without taking into account the loss sustained by those who die under 20 years of age not living on to 70 years. Could all their lives be prolonged to 70, they would earn probably \$300,000,000 more per year in the Dominion. But we may leave these out of the estimate for the present.

In this money estimate no account has been taken of the loss of stamina—the debility—the “muscular tenuity,” which cannot be estimated, neither as regards the present generations nor the generations of the future, as resulting from sickness, much of which might be prevented.

HOW MUCH OF THIS IMMENSE LOSS MAY BE PREVENTED?

The best living authority, Mr. Simon, late of the Government Board, Great Britain, says, in reference to the deaths in Great Britain, “The deaths which occur in this country (Great Britain) are fully a third more numerous [life being proportionately prolonged] than they would be if our existing knowledge of the chief cause of disease were reasonably well applied throughout the country.”

In some towns in England the total death-rate has been lowered over 20 per cent.; in many towns the death-rate from typhoid fever has been diminished from 33 to over 50 per cent., and in others the death-rate from consumption has been lowered from 20 to 40, and even 49 per cent., all by thoroughly cleansing the towns, providing a pure water supply for domestic purposes, and drainage.

According to the *Lancet* (London), the mortality statistics have shown a steady decline in the death-rate from fevers during the past few years from 80 to 45 per 100,000 persons living, while in preceding years it had averaged 93 per 100,000. The *Lancet* points to this as “a preliminary triumph of Sanitation.”

It is believed that by means of the practical application of Sanitary work, a greater proportionate reduction can be made in the sickness rate than in the death-rate.

In Canada probably as much can be done as in England, where very much had previously—from 20 to 40 years ago—been done in public health work. The death-rate in Canada is probably as high as it is in England, if not higher. The cities here are not so densely populated, it is true, but it must be borne in mind that two prevalent and fatal diseases, typhoid fever and diphtheria, are here as elsewhere more prevalent or fatal in rural than in urban municipalities.

Now if instead of a one-third reduction in the death and sickness-rate, a reduction of one-tenth could be brought about, what a large sum of money would be saved annually thereby; over thirty-eight millions of dollars in Canada, and over fourteen millions in Ontario, taking a low estimate. And this could doubtless be accomplished with a small outlay. A few thousands of dollars spent in educating the people would do a great deal. No other investment pays nearly so well as that spent in promoting the public health.

IN WHAT WAY MAY THE PUBLIC HEALTH BE BEST PROMOTED?

What Sanitarians in Canada deem desirable for the Dominion is, that there be established a Provincial Board of Health in each of the Provinces, and a central Board, Bureau, or Department at Ottawa; and an amended Act, requiring the organization of a Local Board in each municipality.

Almost every civilized country except Canada has some central organized body to look after the public health. England has long had its Government Board, Prussia, Austria, and Russia have their Imperial Boards, France has a similar body; so has Denmark and the Netherlands. Japan is not behind in this regard; nor are the South American States. About twelve years ago Massachusetts provided for a State Board, which has ever since been active in Sanitary work. Michigan followed Massachusetts seven or eight years ago, and other States have done likewise from year to year; and now some 25 or more States have each a State Board of Health, with Government money appropriations for their use of \$3,000 or \$4,000 to \$15,000. In Vermont and Georgia the appropriations are less. Two years or more ago a National Board was formed, with its head-quarters at Washington, and the Federal Government appropriated for its use \$500,000. It is giving, as it appears are the State Boards, universal satisfaction, and all are accomplishing most valuable work.

At the meeting of the Ontario Medical Council in July, 1880, in Toronto, Dr. Grant, of Ottawa, offered the following resolutions, which were carried unanimously:

1. That the members of this Council are of opinion that there is no subject of greater importance to the well-being and prosperity of the Dominion than that of public hygiene.
2. That in order to keep pace with the scientific progress of the age, and give greater evidence of an earnest desire to promote sanitary measures, this Council is of opinion that a Central Bureau of Health should be established at the Capital, under the control of the Federal Government.
3. That as a Central Bureau of Health meets with the unanimous voice of our profession in Canada, it deserves the well-timed consideration of the Federal Government.

Hon. Senator Dr. W. H. Brouse, of Prescott, said he thought the Ontario Government also should take steps to legislate on this question. It was the great question of the age, and its importance would be urged with greater force upon the attention of legislative bodies in the future.

Later in the Session Dr. Daniel Clark, Supt. Provincial Lunatic Asylum, Toronto, proposed the following resolution:

"That in the opinion of this Council, while it is very desirable that a Central Bureau of Health for this Dominion should be established in Ottawa, the Provincial Government of Ontario should make some provision at an early day for promoting the public health in this Province by providing some central organized body, such as the Government may deem best, with functions similar to the Imperial Boards of Health of most European countries, and the State Boards of Health of most of the United States, chiefly for the purpose of educating the people in health matters, obtaining information in reference to the public health, and for perfecting, as far as possible, the return of vital statistics." Carried unanimously.

At the last meeting of the Canada Medical Association, in September, 1880, in Ottawa, the able President, Dr. Howard, of Montreal,

in his address in reference to this subject, strongly urged the formation of Dominion or "National" Boards, Provincial Boards, and Municipal Boards, for the complete supervision of the public health and vital statistics.

During the session it was moved by Dr. Canniff, Toronto, afterward President elect, seconded by Dr. Sullivan, Kingston,

"That it is the unanimous opinion of this Association that at the present time there is subject demanding the attention of the Legislature of this country of greater importance than that of the public health; and in order that Canada may not be behind other countries in this matter, it is very desirable that both the Dominion and Provincial Government should, with as little delay as possible, legislate and provide means for the better promotion of the public health throughout the Dominion." Carried.

This resolution is being confirmed by local Medical Societies.

Three sessions ago the Committee on Public Health of the Ontario Legislature, moved for by the Attorney-General, which included the medical men in the House, and of which the Hon. Adam Crooks was chairman, found upon enquiry that little or nothing was being done in this Province to protect the public health, and recommended, in the printed report, that further measures be adopted with this view.

Surely all this is enough to stimulate to immediate action in this behalf.

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