Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured covers/ Couverture de couleur
- ☐ Covers damaged/ Couverture endommagée
- ☐ Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/ Le titre de couverture manque
- ☐ Coloured maps/ Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- ☑ Bound with other material/ Relié avec d'autres documents
- ☑ Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☐ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☑ Quality of print varies/ Qualité inégale de l'impression
- ☑ Continuous pagination/ Pagination continue
- ☐ Includes index(es)/ Comprend un (des) index

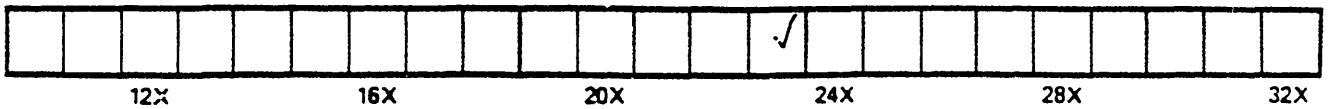
Title on header taken from:/ Le titre de l'en-tête provient:

- ☐ Title page of issue/ Page de titre de la livraison
- ☐ Caption of issue/ Titre de départ de la livraison
- ☐ Masthead/ Générique (périodiques) de la livraison

☐ Additional comments:/ Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X 12X 14X 16X 18X 20X 22X 24X 26X 28X 30X 32X



VOL. VIII. OCTOBER. No. 10

CANADA HEALTH JOURNAL,

A MONTHLY MAGAZINE OF

PREVENTIVE MEDICINE

EDITED BY:

EDWARD PLAYTER, M.D.

Public Health and National Strength and Wealth.

CONTENTS.

Subscription Price, $2.00 per year; Single Copy, 20 Cents.

ADDRESS ALL COMMUNICATIONS,

"HEALTH JOURNAL," Ottawa.

THE CANADA HEALTH JOURNAL.

VOL. 8. OCTOBER, 1886. No. 11.

THE BACTERIA OF DISEASE.

BY HENRY HUN, M. D., ETC., ALBANY MEDICAL COLLEGE. FROM ALBANY MEDICAL ANNALS.

YOU all know that in the air we breathe, in the water we drink, and in the earth under us, there are a great number of globular, cylindrical or filiform bodies, which are so minute that they can be seen only under the higher powers of the microscope, and which, when placed in a suitable medium, absorb food, move about, grow larger, reproduce themselves, and give other manifestations of life. These little bodies are, therefore, living organisms, and upon close examination they are found to consist of a central mass of protoplasm enclosed in a membrane or cell wall. They are really small cells, which, however, differ very much in appearance from the cells with which we are familiar as occuring in the human body. Many of the little cellular bodies have the shape of little rods, and in consequence the whole class have received the name bacteria, from a Greek word signifying "a little rod." The class of bacteria stands very near the border line of the animal and vegetable kingdoms; and although at the present time there is a general unanimity of opinion that they belong to the vegetable kingdom, yet there is still some dispute whether they should be classed among the algæ or fungi.

It has not as yet been possible to classify all the different kinds of bacteria, but there are three great groups into which they can be divided according to their form. They are, micrococci, bacilli, and spirilla.

Micrococci are spherical or elliptical bodies which very rarely exceed 2 micromillimeters in diameter. They occur either in separate granules, or in rows like a chain of beads, or in quite large groups imbedded in a gelatinous mass, such a group being called a zoöglœa, from the Greek for "animal," and "glue."

Bacilli are rods, varying in length from about 1 to 6 micromillimeters and in diameter from 2 micromillimeters down to a diameter too small to be measured. They occur either as separate rods or in the form of dense groups, called swarms, or arranged end to end in long chains, which are called leptothrix, from the Greek for "fine," and "hair."

Spirilla are undulating or spiral filaments varying in length from 4 to 40 micromillimeters. They occur either singly or matted together in clusters.

The conditions requisite for the life and development of bacteria are (1) warmth; (2) water; (3) oxygen, either free or in combination; and (4) a sufficient quantity of organic matter to serve as food. When all these conditions are fulfilled, the bacteria develop with great rapidity until they have exhausted their supply of food; that is, until they have converted the complex organic molecules either into inorganic molecules or into simpler organic molecules, according as there is an abundant or an insufficient supply of oxygen present. When the organic matter is in solution, and when air or oxygen is artificially supplied to this solution in such abundance that there is always free oxygen present, then the bacteria convert the organic matter into carbonic acid, water and ammonia directly, without the production of any evil-smelling compounds. When, however, the supply of oxygen is limited, as is always the case in nature, then in the decomposition of the organic matter through the agency of bacterial life certain bad-smelling compounds, such as sulphuretted hydrogen, etc., are formed, and the process is called putrefaction.

From numerous experiments it appears that all putrefaction is directly caused by bacterial life. All the dead organic matter in the world, except what is burned and what is consumed by animals as food, is converted back into inorganic matter by means of putrefaction. Were it not for the bacteria, the dead organic matter would remain in the world unchanged; and, although organic matters sometimes putrefy sooner than is desired, yet, in general, the bacteria perform a very useful and neccessary work in removing the dead organic matter from the world and returning it to the inorganic kingdom. They are the great scavengers of nature.

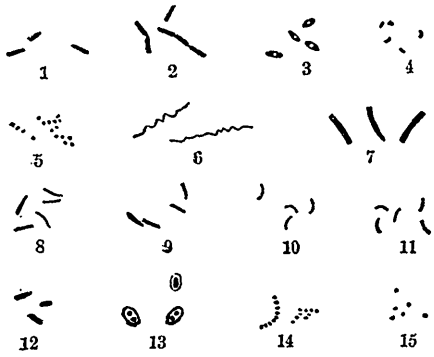


Figure 1 represents one of the useful bacteria. It is called the bacillus subtilis, and sometimes the hay bacillus, because it is found abundantly on the surface of hay. It is found very commonly in putrefying matters, and is about 2 to 6 micromillimeters in length and about 2 micromillimeters broad. Under high magnifying powers (700 diameters) the bacillus subtilis appears as a short rod, but under the very highest powers (4,000 diameters), and with suitable illumination, it exhibits at each end flagella, which are constantly lashing backwards and forwards during the life of the bacillus. Similar flagella exist on all or almost all of the bacilli and spirilla, but not on the micrococci. The bacteria subtilis, as almost all of the bacteria, can be cultivated artificially either in solutions of organic matter or on a slice of potato or in a solid mixture of gelatin and blood serum. They can be best studied when growing in the solid gelatin, and it is seen that the different kinds of bacteria grow in groups or colonies, which always present the same appearance in the same kind of bacteria, and which differ so greatly in appearance in the different kinds that they can be distinguished from each other by the naked eye.

When their growth and development are carefully observed, it is found that bacteria reproduce themselves in one of two ways—either by fission or by sporification. In the process of fission, the bacterium grows larger, a constriction appears at its middle and becomes so deep that it divides the bacterium into two precisely similar bacteria, which may in turn subdivide. Sometimes before the bacteria separate from each other they each subdivide again, and thus a long chain of bacteria may be formed. The process of fission is shown in figure 2. In the process of sporification, small glistening particles, called spores, appear in the substance of the bacterium, and are set free by the disintegration of the bacterium. They resist injury, such as high temperatures, much more strongly than do the bacteria, and when placed in favorable circumstances they become elongated at one end, grow rapidly, and develop into the adult bacterium. The process of sporification is shown in figure 3. "As far as observation goes, young bacilli invariably grow and multiply by division for some time before they produce spores. Continued vegetation without change of soil is usually terminated by the formation of spores, and these spores, as a rule, will not germinate in the unchanged soil where they are produced" (Gradle).

The bacillus subtilis stands as a representative of the bacteria which are not only harmless, but are extremely useful to the world and to man. Such bacteria surround the body on all sides. They are found in abundance in the mouth, in the intestines and in all parts of the alimentary tract. The tissues of the human body offer such a resistance to them that they cannot penetrate into the human body proper, and they are never found in the blood nor tissues of a healthy person.

There is, however, another class of bacteria, the members of which, under certain conditions, enter into the body

and produce there disturbances which we call disease. There are many diseases each one of which is due solely to the entrance into the body of one or more bacteria of a certain distinct kind. As long as these bacteria are kept out of the human system the corresponding disease will never occur, but whenever these bacteria enter into the body then the disease may occur. The remaining twelve figures of the above group represent some of the bacteria which produce disease, or pathogenic bacteria, as they are called. Each of these species of bacteria is distinct from every other, and although they have been cultivated under a great variety of conditions, it has not as yet been possible to convert one species of bacteria into another, and no matter through how many generations it has been cultivated, the last generation is as virulent as the first, and produces the same disease when inoculated in animals. It is possible, however, to render the bacteria less virulent. There are a number of species of bacteria which, when allowed to remain for months in the same culture fluid, suffer a loss of vital power, and when these weakened bacteria are inoculated into animals, they produce the definite specific disease in a mild form. Such inoculations render the animal more or less insusceptible to the disease thereafter, and this is the principle of preventive inoculation for disease.

Figures 4 and 5 represent the bacillus septicus and the micrococcus septicus respectively. The former is about 1.4 micromillimeters in length and 0.7 micromillimeters in breadth, and the latter is about 0.5 micromillimeters in diameter. Either of these bacteria injected under the skin of rabbits, birds and some other animals, will cause death in from sixteen to forty hours, with the symptoms and lesions of septicæmia, and in the blood of the animals thus destroyed are found many bacteria similar to those injected, and these bacteria can be cultivated outside of the body through many generations without losing any of their virulent powers. These two specimens will serve as examples of the bacteria of septicæmia, although there are other bacteria which will cause this disease. The bacterium causing pyæmia is a micrococcus somewhat similiar to those represented in figure 5.

Figure 6 represents the spirillum of relapsing fever, called the spirochæte Obermeyeri after its discoverer. These spirilla make their appearance in the blood a few hours before the fever, and increase so rapidly in number that during the height of the fever they may even exceed the red blood discs in number, and then disappear as the fever passes off. Although it is probable that the presence of these spirilla in the blood causes the fever, yet it has been impossible to cultivate them outside of the body, so that the experiment of injecting some of a pure culture of them into animals cannot be tried. The spirilla vary from 12 to 43 micromillimeters in length and are shaped like a corkscrew, exhibiting from four to ten turns. In figures 4, 5 and 6 we have examples of each of the great groups of bacteria—the bacillus, the micrococcus and the spirillum.

Figure 7 represents the bacillus anthracis—the bacillus of anthrax—the disease called splenic fever in cattle and sheep, and in man, malignant pustule. The bacillus has a length of from 3 to 6 micromillimeters and a breadth of a little more than 1 micromillimeter, and has been more thoroughly studied than any other bacillus of disease. In the bodies of animals this bacillus multiplies only by fission, but when cultivated or growing outside of the body it multiplies by sporification. The bacillus of anthrax introduced into the body causes first a local abscess, then a swelling of the neighboring lymphatic glands, and then the bacilli appear in great numbers in the blood and death soon results. Like all infectious diseases, anthrax has a period of incubation, which varies in different animals, seeming to depend in part on the size of the animal.

Figure 8 represents the bacillus tuberculosis, which are extremely thin rods varying in length from 2 to 4 micromillimeters. These bacilli are found in all tuberculous growths. In young tubercles they are especially abundant in the giant cell. In old tubercles they are found in the periphery, which is the part of most active growth. In the dried or caseous matter no bacilli, but

only spores, are present. The bacillus tuberculosis is present in the exportation of persons suffering from pulmonary consumption. The bacilli tuberculosis can be cultivated outside of the body. They increase in number only very slowly and only when kept at a temperature between 30° and 41° C. When a very few bacilli tuberculosis are introduced into the aqueous humor of the eye of an animal, small grey miliary tubercles appear on the iris and neighboring parts. These increase in number, coalesce, and lead to a general tuberculous inflammation, which destroys the eye. Later, miliary tubercles appear in the neighboring lymphatic glands, and afterwards in the other organs of the body.

Figure 9 represents the bacillus of leprosy, which is a little thicker and longer than the bacillus tuberculosis. This bacillus is always found in the new growths of leprosy, but it has not as yet been possible to inoculate it in animals.

Figure 10 represents the bacillus of Asiatic cholera (the comma bacillus of Koch), which is found in the dejections, in the contents of the intestines, and in the intestinal glands, in cases of cholera. This bacillus has the form of a written comma, and is about 2 micromillimeters long and 0.5 micromillimeter thick. It is destroyed by acids, and only thrives in alkaline solutions. It can readily be cultivated outside of the body. The normal acidity of the gastric juice kills it, and in order to successfully inoculate it in animals it must be injected into the intestines, where it will meet with an alkaline fluid. When thus injected, it speedily causes death, with all the symptoms and lesions of cholera. The comma bacillus of Koch has been the subject of much dispute, and many observers have claimed that they have found precisely similiar bacillia of a more or less harmless nature. One by one, however, these various bacillia have been shown to bear only a very superficial resemblance to the true comma bacillus, and now only one bacillus remains which bears any close resemblance to the comma bacillus.

Figure 11 represents the bacillus which is called the comma bacillus of Finkler and Prior, and which is found in the contents of the intestines and in the recent dejections of cases of cholera morbus. These bacilli are a little thicker than the comma bacilli of Koch, and differ from these latter also in their manner of development and in the effects produced when they are injected into the intestines of animals.

Figure 12 represents the bacillus of typhoid fever. It is shorter and much thicker than the bacillus tuberculosis, and is rounded at its extremities. It has been found in the intestinal follicles, mesenteric glands and spleen in about half of the cases of typhoid fever in which it has been sought. It can be cultivated, but it has not as yet been successfully inoculated in animals, so that its causal connection with typhoid fever has not been satisfactorily established.

Figure 13 represents the micrococcus of pneumonia, or the micrococcus of Friedlaender. This micrococcus is surrounded by a gelantinous capsule, which usually encloses two or three micrococci, two being thus enclosed with especial frequency. These micrococci occur in the exudation in the alveoli, especially near the walls of the alveoli, and in the expectoration. They can be cultivated outside of the body, and when inoculated in animals pneumonia is produced.

Figure 14 represents the micrococcus of erysipelas, which has a tendancy to form curved lines like a chain of beads. It can be cultivated outside of the body, and when inoculated, erysipelas results. It has, indeed, been inoculated in man for therapeutic purposes, in the hope of arresting the growth of tumors, etc. From such inoculations it has been learned that an attack of erysipelas protects the person for a variable period from another attack. The immunity usually lasts for three months.

Figure 15 represents a micrococcus which is always found in diphtheritic membranes, although up to the present time it has not been possible to satisfactorily isolate it.

These figures do not exhaust all the varieties of the bacteria of disease which are known. The micrococcus of gonorrhœa and the bacillus of syphilis, of xerosis conjunctivæ, of glanders, have all been isolated, and in all probability cause the diseases from which they de-

give their names, while many other bacteria have been discovered which probably, although not certainly, cause certain diseases, such as trachoma, rhinosclerma, small-pox, whooping-cough, etc.

Whenever any of these pathogenic bacteria enter into the body, they absorb their food and oxygen from the tissues, and grow and multiply. If this growth and multiplication were unchecked, they would consume all the tissues and soon cause the death of the animal. The animal system, however, possesses the power of acting upon the bacteria and destroying them more or less completely, and as a result of this action a complex of symptoms is produced which is called disease. The essence of many forms of disease consists in a struggle for existence between the bacteria and the animal tissues. In the case of the simplest animals this struggle can be observed under the microscope. The simplest form of animal life is the amœba, which is altogether similar to the lymph corpuscles of animals, and when a little lymph from a frog is placed together with a few bacilla of anthrax on a warm stage and observed under the microscope, some very noteworthy phenomena take place, which have been described by Prof. Metschnikoff, of Odessa. . . .

From these it appears that the lymph corpuscles possess not only the power of taking the bacteria into their interior, but also of causing them to disappear, [of consuming or eating them so to speak. —Ed.] The bacilli either break up into small fragments or granules or else their outlines become more and more indistinct till they disappear. In this way the lymph cells destroy the bacilli. In other cases the bacilli destroy the lymph cell, causing it to burst and disappear. By further researches Prof. Metschnikoff finds that the bacilli are not destroyed by the fluids in the tissues, but only by the white corpuscles, and it appears that when a white corpuscle has eaten one or more bacilli it thereby becomes changed so that thereafter it is able to destroy the bacilli more easily. Finally, Metschnikoff finds that at certain temperatures the white corpuscles act more strongly and the bacilli less strongly, so that the latter are destroyed by the former, while at other temperatures the reverse is the case. From these experiments it would appear that there is a mutual antagonism between the lymph cells, or white blood corpuscles, on the one hand and the bacteria on the other, and that when the latter enter into the human body the former tend to destroy them.

Another set of experiments by Strauss definitely prove what has long been a matter of doubt, that chemical irritants, such as turpentine, croton oil, etc., cannot produce suppuration without the presence of bacteria. In the light of these two sets of experiments (first, that without the presence of bacteria, pus is never formed, and, second, that the pus cells, or white blood corpuscles, can destroy the bacteria), we are able to understand a little more clearly the meaning of some of the phenomena of septicæmia in the broadest sense of the word. When the fresh surface of a wound is free from all septic bacteria, the wound heals quickly, without suppuration or constitutional disturbance. When, on the other hand, septic bacteria are present on the surface of a wound, then the wound does not heal quickly, and suppuration and other symptoms of disease appear. Pus is poured out on the surfaces of of the wound and prevents their uniting, and, although this formation delays the healing of the wound, yet it is of great value in the preservation of the well-being and the life of the individual, and is really curative in its nature. It is the only barrier which can be thrown out against the general infection of the body. The pus cells are the only elements which can destroy the bacteria. If these latter are few in number, they are quickly destroyed by the cells, little or no destruction or decomposition of tissue is produced, the flow of pus ceases, and the wound heals. If, on the other hand, the bacteria are in great abundance, they grow and multiply, and not only destroy many of the cells and the tissues, but in so doing produce decomposition and putrefaction, so that the pus and discharge from the wound has a very unpleasant odor. In such a case many of the bacteria pass beyond the barrier of cells poured out to destroy them, and, entering the lymph channels, reach the nearest lymphatic glands. Here the same process is re-

peated. There is a curative hyperplasia of the glands; that is, there is within the glands an increase in the number of lymph cells, which may destroy the bacteria, so that with the hyperplasia of the lymph glands the disease may terminate. In severer cases, however, the bacteria are so numerous or so virulent that they pass beyond the lymph glands and enter the general circulation. Then appears a remarkable symptom which is called fever, and which consists essentially in an increase in the heat of the body.

The fever which is produced by the entrance of bacteria into the blood causes much discomfort, and is at times dangerous to life, and yet in all probability it fulfills a most useful purpose.

The bacillus anthracis has its greatest activity and produces spores only between the temperatures of 64½° and 107½° F. Pasteur claims that anthrax cannot be inoculated in a fowl, because its normal temperature (106½°) is too high for the life and growth of the bacillus, but when the normal temperature of the fowl is lowered by immersing its legs in cold water, then it can be inoculated with the bacillus successfully. The bacillus tuberculosis can be cultivated only between the temperatures of 86° and 106°.F. The spirilla of relapsing fever are rendered motionless in a very few hours by a temperature of 104° F., and it is probable that a temperature of 103° to 106° F. will weaken all the bacteria so greatly that they are readily destroyed by the white corpuscles of the blood, while at the normal temperature of the body the bacteria might destroy the white corpuscles. It seems, therefore, altogether probable that the fever of septicæmia, as well as every other form of fever, is curative in its nature, in the same way that the suppuration and the hyperplasia of the lymph glands are curative.

In cases of septic poisoning the system reacts against the pathogenic bacteria by suppuration, hyperplasia, of the lymphatic glands and fever. These are the three great symptoms of septic poisoning, and they are all curative in their nature. The treatment of any case, therefore, should be directed, not against the symptoms, but should be calculated to weaken the vitality of the bacteria and increase that of the white corpuscles.

In a manner quite similar to that described for septicæmia, almost all the other pathogenic bacteria, when introduced into the system, produce at first a local inflammation, then, a hyperplasia of the neighboring lymphatic glands, and finally fever. Each of the symptoms causes discomfort, and each may become so excessive as to destroy the life of the patient; yet in their essential nature they are curative, and our therapeutic efforts should be directed, if possible, against the cause of the disease and towards maintaining the patient, while an attempt should be made to modify the symptoms of disease only when they are manifestly excessive.

In the light of our present knowledge, it seems to me that we can hardly attach too much importance to the following sentence with which, in the middle of the seventeenth century, Sydenham commenced his medical essays: "A disease, in my opinion, how prejudicial soever its causes may be to the body, is no more than a vigorous effort of nature to throw off the morbific matter, and thus recover the patient."

REPORT ON STATE MEDICINE.

BY GEORGE H. ROHÉ, M. D.—IN PHILADELPHIA MEDICAL TIMES.

ADMINISTRATION OF SANITARY LAWS.

DR. O. W. WIGHT. the efficient health officer of Detroit, read a paper before the Michigan State Medical Society, in which he pointed out the necessity of a new plan of public sanitation. He proposes that the country shall be the unit of sanitary administration. A tax of ten cents per capita should be levied by the State for sanitary purposes. In a county of thirty thousand inhabitants this tax would

produce (if collected) three thousand dollars per year. One half of this should go to pay the health-officer who should be a physician; the other fifteen hundred dollars should pay the salaries of a clerk and an inspecting officer. There should be a county board of health, composed of two physicians and one lawyer, to serve without compensation. They should be appointed by the board of county commissioners; the board of health should appoint the health-officer, and the latter should appoint his clerk and inspector. "The health-officer thus appointed, before qualifying and entering upon his duties, should be required to undergo an examination by the State board of health, for the purpose of having his fitness for the place fully determined. In addition to his medical knowledge, he should also know the elements of sanitary engineering, of chemistry, and of the law of nuisance; he should be perfectly familiar with the laws which he is to administer; his executive capacity and his character for industry, impartial justice, discretion, and moral courage should be taken into consideration. His tenure of office should be during good behavior, and he should be clothed by law with the necessary powers of independent action."

[When the millennium arrives, some such scheme as that proposed by Dr. Wight may work. His own experience with boards of health and council committees has doubtless shown him that his plan is premature. The model health-officer for years to come will be of the prevailing type of ignorant, time-serving politician. Whether he has M. D. as a pendant to his name does not much matter. In fact, the medical politician generally has even less backbone than the other sort when the "boss" demands places in the department for his favorites.—R.]

THE UTILIZATION OF SEWAGE.

Want of success in disposing of solid excreta, whether collected by means of the dry-earth, Rochdale, or Liernur systems, has led American sanitarians to turn hopefully to the intermittent infiltration system, as practised in many places in Great Britain, Germany, and France. In this country the system—in combination with the separate system of sewerage—has been adopted at Pullman, Illinois, and Atlantic City, New Jersey,—in both places, it is stated with great satisfaction. At the insane asylum at Norristown, Pennsylvania, Colonel Waring (this journal, April 30, 1886) has recently completed a plan of drainage, with ultimate disposal of the sewage by irrigation, which seems to be complete in every particular and to answer all the demands of sanitary science. Colonel Waring, who has studied the subject more thoroughly perhaps than any other engineer or sanitarian in this country, has arrived at the conclusion that the system of sewage-disposal by intermittent surface-irrigation "answers every requirement of simplicity, safety, and decency."

CREMATION OF GARBAGE.

The disposal of refuse by burning has been advocated by many sanitarians. At the last meeting of the American Medical Association a good paper (not yet published) was read upon the subject by Dr. G. S. Franklin, of Ohio, and at the sanitary convention of the Pennsylvania State Board of Health a description was given of an apparatus designed to dispose of human excreta in this manner. J. Zellweger also publishes designs of a garbage-furnace, and points out the requisites for such an apparatus. According to the latter writer, the cremation of garbage consists of several distinct processes, classified as follows: (1) drying of the fresh charge, (2) destructive distillation of the dry matter, (3) burning of the remaining charcoal and coke, and (4) decomposition and oxidation of the organic vapors and gases produced in drying and charring the garbage.

"These several processess must be carried on separately, and in different parts of the furnace, so that the consumption of heat does not interfere with its production. It is essential, for the successful cremation of garbage, that the full calorific power of the fuel be developed and all the available heat be transferred to the fire-gases before these are allowed to mingle with the aqueous vapors and organic gases rising from the

fresh charges in the furnace. The heat produced by the combustion of charcoal, coke, and the gases expelled by destructive distillation is then brought to act upon the gases mingled with and protected by steam to decompose them, and to cause their oxidation in the accompanying air."

The furnace designed by Mr. Zellweger seems well adapted for securing the results above stated at a reasonable cost.

The Health Committee of the Wheeling (West Virginia) Common Council has recommended the adoption of the system in that city. It is said that a furnace of sufficient capacity for the purpose could be constructed for two thousand and fifty dollars, but no estimates are given of the cost of running the same. Wheeling had a population in 1880 of 30,737.

PROPRIETARY AND PATENT MEDICINES AND THE PUBLIC HEALTH.

Dr. Frank Woodbury, in a paper read before the Pennsylvania State Sanitary Conference, called forcible attention to the alarming frequency with which narcotics, stimulants, and other classes of medicines were consumed by the public without directions of a physician. In view of the absence of all effectual restrictions upon the sale of medicines in this country, he advocated the following conclusions:

1. The examination of all proprietary medicines by a government or State commission of experts, which shall have power to permit the sale of such as are harmless or especially likely to prove serviceable, and to prohibit the sale of all which are liable to do injury, and particularly those which are found to be worthless and fraud upon the public. Such a commission was appointed by the Japanese government several years ago, and has been found to be a great service in that country.

2. The instruction of the public to properly estimate drugs, and to regard every unknown medical agent as dangerous and endowed with capacity for harm. Let them endeavor to escape the caustic criticism of a Molière upon those who "pour medicine about which they know little, into bodies about which they know less, in order to cure disease about which they know nothing at all."

TYPHOID FEVER AND POLLUTION OF DRINKING-WATER.

Dr. Charles Smart, Surgeon U. S. A., read an excellent paper before the Pennsylvania Sanitary Conferenee upon "Wholesome Water for Cities and Towns" (this journal, June 26, 1886), in which statistics are given to show the influence of an impure water-supply upon the spread of typhoid fever. Thus, for the past ten years, the average annual mortality from typhoid fever for every 100,000 of population was 66.1 in Philadelphia, 52.5 in Baltimore, and 24.6 in New Orleans. The water-supply of Philadelphia is contaminated with sewage; that of Baltimore, generally pure, is partly drawn from pumps, which necessarily furnish exceedingly impure water; while that in New Orleans, being almost exclusively rain-water, collected in cisterns above ground is little subject to sewage-pollution. The result is shown in the typhoid mortality, which is less than half of that of the sewered city of Philadelphia. . . . . .

SANITARY INSPECTION OF SCHOOLS.

In Hungary the following regulations governing the sanitary administration of schools have recently been established:

Every middle-class school is to have a medical officer, who will receive an annual salary of two hundred florins in schools where a complete course of instruction is given, and one hundred florins in other schools. He must examine all the pupils at the commencement of each scholastic year, and keep a constant watch over their health, and must give special attention to the prevention or eradication of infectious diseases. He will also give advice during gymnastic exercises. He will also keep watch over the instruction in general and if he observe any deleterious influence in operation, with regard either to the whole school or to individual pupils, he will bring the same to the notice of the director of the school. In the upper schools he will give instructions in hygiene for two hours each week to those pupils of the higher classes who may desire to receive it, the subject being treated in an easy and popular manner.

In Paris, also, regulations governing the sanitary administration of schools have been adopted. In the girls' schools a young woman with a medical education has been appointed a sanitary inspector. Her duties are to see that the girls are not overworked, and that they perform their tasks under the best sanitary conditions possible. This is a long step in advance. Its adoption by school authorities in this country will mark the beginning of a new era in public hygiene.

EXPERIMENTS IN FILTRATION.

BY T. HATFIELD WALKER, L. R. C. P., F. C. S., ETC., ANALYST FOR THE CITY OF CARLISLE, LATE MEDICAL OFFICER, AUTHOR OF "SEWAGE FILTRATION, ETC."

FROM SANITARY RECORD.

THE experiments were commenced with a twofold object in view: first to endeavor to ascertain the relative value of various filtering media; and second, to compare the bacteriological tests with the chemical analysis of water.

The media tried were animal charcoal, coke, block charcoal, charcoal specially prepared, and arranged in layers (Mawson & Swan's filter), spongy iron (Bischof's filter), iron and chalk.

The media were tested under much the same circumstances as they would be when in use. About a gallon of water was daily passed through each filter, and tested at intervals. The experiments are not yet concluded, but the following points are clearly brought out:—

First, that a filter which prevents the passage of bacteria for the longest period, or allows the least number to pass, may not by any means be the best for separating organic matter, and *vice versa*. Thus, a water filtered through coke gives on cultivation the least number of colonies of bacteria, and it retains this power for the longest period; but the water on analysis was found to contain a large amount of organic matter. Bischof's (iron), too, gave good results when tested by the biological method, but it does not separate organic matter nearly so perfectly as the animal charcoal filters. From this it is obvious that the biological examination of water is of little use alone, but is doubtless of great aid when combined with chemical analysis. Thus, a peaty water, which gave on cultivation only sixteen colonies of liquefying bacteria, was found on analysis to give ·18 milligrames of albumoid ammonia per litre; while distilled water, to which a little sewage had been added, gave so many colonies as to completely liquefy the gelatine on the third day, yet only evolved .08 milligrammes of albuminoid ammonia. The sewage water would doubtless have been passed if tested by chemical analysis alone, and the peaty water, although fairly good, would have been condemned. The biological test would in such cases be of great use.

As would be expected, some waters were much more improved by filtration than others. Our town water (Newcastle-on-Tyne), when filtered through Mawson & Swan's filter, in which there was a special layer of extra fine charcoal, had its albuminoid ammonia reduced from .16 to .06; but in sewage water it was reduced from 3·4 to ·05.

Although the filtered water in the case of each medium (after the medium had been in use for some time) gave on cultivation a large number of colonies of bacteria, yet it is a question whether disease germs would not be retained, and perhaps destroyed in the filter. A water containing a large quantity of bacillus subtillis was passed through an old Mawson & Swan's filter. On making a cultivation of the filtered water I was not able to find any of the bacilli, but owing to the difficulty of the subject I shall require more experience before giving an opinion on this question. I am now commencing a series of experiments with bacillus typhosus, and hope to be able to give the results in my next paper.

I was very much surprised to find the Mawson and Swan's (specially prepared animal charcoal) filters removed all the carbonate of lime and magnesia from the water filtered through them. A water having 20° of hardness gave after filtration only 1°—*i. e* the same as distilled water—and a water containing

6 grains of bicarbonate of calcium and 2 of bicarbonate of magnesia had the whole entirely removed by one single filtration. I dissolved out the carbonate of calcium and magnesium from a filter that had been in use for eight months, and through which about 250 gallons of water of about 16° hardness had passed; after precipitating the phosphate of calcium I found 5½ ounces of carbonate of calcium; a new filter similarly treated gave 1¾ ounces, so that over 4 ounces had been separated from the water which had passed through the filter.

Lead and iron were also entirely removed from the water by Mawson & Swan's filters (the charcoal filters), and this property was retained after 200 gallons had been passed. The water experimented on contained 1 grain of lead per gallon.

With regard to the relative value of the different media with which I have experimented, undoubtedly the animal charcoal has given the best results. I was disappointed with the spongy iron; I fully expected it to come out best. It certainly gave better results as regards the decrease in the number of bacteria. Thus the carbon at first entirely stopped all germs, but after a few weeks they became sufficiently numerous to liquefy the gelatine, which did not occur to the same extent with the iron as long as I was able to use the filter; But as regards the oxidation or separation of organic matter, the charcoal was far superior; moreover after about 100 gallons had been passed through the iron filter the water filtered so slowly that it became impossible to carry on the experiments. I took out and cleanssed the medium, and on replacing found it filtered at the rate of one gallon in forty minutes, but after ten gallons had again passed it had become so slow as to require seven hours to pass one gallon.

The block charcoal filter soon lost its power. After 200 gallons had passed it reduced ·3 milligrammes alb. am. to ·26, and reduced hardness from 16° to 14°·6. it reduced the alb. am. in another water from ·16 to ·12.

The coke appeared to be the best from a bacteriological point of view, but did not come out so well with regard to organic matter. I purpose experimenting further with it, as I think I have not had it as finely powdered as it might be. The iron and chalk gave results much the same as the coke.

As is well known, the purifying power of moist media is inversely proportionate to the speed at which the medium filters—*i.e.* the slower it filters the more perfect is the filtration. Moreover, the method of arranging the media has great influence; if arranged in layers varying in fineness it is much greater than when indiscriminately mixed. This is especially marked in the case of charcoal. When very finely powdered, fresh charcoal arranged as in Mawson & Swan's filters, will reduce sewage to 1.60 the original amount. One of their filters did actually reduce the alb. am. in sewage water from 3·6 to ·05 milligrammes.

It is very important, too, that the filters should have abundance of time to allow aeration; when they were overworked—*i.e.* several gallons being put through the two gallon size daily—I found the results were not nearly so good.

Although these experiments are far from being an exhaustive examination of the subject, they have occupied me for more or less time every day during twelve months, and I have filtered some thousands of gallons of water through the various filters, and have made between fifty and sixty bacteriological and chemical analyses. I intend during the next few months to endeavor to ascertain the effect of various filters on specific germs, such as typhoid, &c., and to clear up some doubtful points which have occurred in my work. When these experiments are completed I hope to publish the complete paper, with the figures of the more important analyses.

INSTINCT IN MEDICINE.

ANIMALS instinctively choose such food as is best suited to them. M. Delaunay maintains that the human race also shows this instinct, and blames medical men for not paying sufficient respect to the likes and dislikes of the

patients, which he believes to be a guide that may be depended on.

Women are more often hungry than men, and they do not like the same kinds of food; nevertheless, in asylums for aged poor, men and women are put on precisely the same regimen. Infants scarcely weaned are given a diet suitable to adults, meat and wine, which they dislike, and which disagree with them. M. Delaunay investigated this question in the different asylums of Paris, and ascertained that children do not like meat before they are about five years of age.

People who like salt, vinegar, etc., ought to be allowed to satisfy their tastes. Lorain always taught that with regard to food people's likings are the best guide. A large number of animals wash themselves and bathe, as elephants, stags, birds and ants. M. Delaunay lays down as a general rule that there is not any species of animals which voluntarily runs the risk of inhaling emanations arising from its own excrement. If we turn our attention to the question of reproduction we shall see that all mammals suckle their young, keep them clean, wean them at the proper time, and educate them; but these maternal instincts are frequently rudimentary in women of civilized nations. In fact, man may take a lesson in hygiene from the lower animals. Animals get rid of their parasites by using dust, mud, clay, etc. Those suffering from fever restrict their diet, keep quiet, seek darkness and airy places, drink water and sometimes even plunge into it.

When a dog has lost its appetite it eats that species of grass known as dog's grass (*chien dent*), which acts as an emetic and purgative. Cats also eat grass. Sheep and cows, when ill, seek out certain herbs. When dogs are constipated they eat fatty substances, such as oil and butter, with avidity, until they are purged. The same thing is observed among horses. An animal suffering from chronic rheumatism always keeps as far as possible in the sun. The warrior ants have regularly organised ambulances. Latreille cut the antenæ of an ant and other ants came and covered the wounded part with a transparent fluid secreted from their mouths. If a chimpanzee be wounded it stops the bleeding by placing its hand on the wound or dressing it with leaves and grass.

When an animal has a wounded leg or arm hanging on, it completes the amputation by means of its teeth. A dog on being stung in the muzzle by a viper was observed to plunge its head repeatedly for several days into running water. This animal eventually recovered. A sporting dog was run over by a carriage. During three weeks in winter it remained lying in a brook, where its food was taken to it; the animal recovered. A terrier wounded its right eye; it remained lying under a counter, avoiding light and heat, although habitually it kept close to the fire. It adopted a general treatment, rest and abstinence from food. The local treatment consisted in licking the upper surface of the paw which it applied to the wounded eye, again licking the paw when it became dry. Cats also when hurt, treat themselves by this simple method of continuous irrigation. Mr. Delaunay cites the case of a cat which remained for some time lying on the bank of a river; also that of another cat which had the singular fortitude to remain for forty-eight hours under a jet of cold water.

Animals suffering from traumatic fever treat themselves by the continued application of cold water, which M. Delaunay considers to be more certain than any of the other methods. In view of these interesting facts, we are, he thinks, forced to admit that hygiene and therapeutics, as practiced by animals, may, in the interests of psychology be studied with advantage. He could go even further and say that veterinary medicine, and perhaps human medicine, could gather from them some useful indications, precisely because they are prompted by instincts which are efficacious in the preservation or the restoration of health.—*Gaillard's Medical Journal.*

THE PREVENTION OF COMMUNICABLE DISEASES.

DR. J. M. ANDERS made the Prevention of Communicable Diseases the subject of an address before the Pennsylvania State Medical Society.

The chances for successful prophylaxis of infectious diseases are greatly increased, he said, in those instances in which the specific organism has been isolated to which the infectious quality is due. The demonstration of the specific cause of a disease often leads, by inciting further study, to the attainment of certain knowledge concerning the indispensable conditions for its development and multiplication. Communicable diseases are in great measure preventable, provided that the known principles of hygiene are rigidly enforced.

The list of communicable diseases is long and varied, and in recent times has been added that scourge of humanity —phthisis. In general this class of affections has a common mode of dissemination—viz., by contagion, by infection, or both, though in varying degrees. As a corollary, there are certain leading principles looking to their prevention, which principles are applicable to them as a class, and they may be conveniently considered under three heads:—First, isolation of the patient; secondly, atmospheric purification by disinfection and ventilation; thirdly, purity of the water supply.

What does proper isolation consist in? Not merely in placing the patient in a separate apartment, having been occupied by other members of the household, but a special room should be set apart for this class of invalids in every comfortable family. Densely populated centers should afford fever hospitals. There are few human interests which could be more successfully promoted by an enlightened public sentiment than the proper isolation of those ill with infectious diseases. There are certain indisputable facts opposing the practicability of complete disinfection of ordinary living-rooms after being used for a patient suffering with a contagious disease. Thus, Prof. Tyndall found by experiment that the air of inclosed boxes at the end of three days no longer swarmed with the microscopical particles which were always found to be suspended in ordinary air. These had all attached themselves to the sides of the boxes. Experiments also show that air-borne bodies have no affinity for organic surfaces. The matters floating in the air of a closed room tend to attach themselves to the side walls, floor and ceiling. Hence, to disinfect such rooms thoroughly it would become necessary to remove all paper from the wall. He pointed out the superior advantages of the sick-chamber especially set apart for communicable diseases. Free ventilation is urged. The observations of M. W. Power have also shown that during the almost absolute stillness of the deposit of dew and hoarfrost particulate matter is most actively disseminating itself through the atmosphere, and further suggested the best modes of obviating such meteorological phenomena. The medical profession would do well to adopt speedily the measures recommended by a committee on disinfection of the American Public Health Association. The conclusions arrived at by this committee show the complete efficacy, both of the heat methods and the chemical disinfectants, to free the atmosphere from air-borne organic impurities and from micro-organisms, and from organisms causing diseases. So long as the efforts of mycalogists to isolate the specific organism causing typhoid fever and cholera are unavailing, conclusive results cannot be expected from water-analysis. But that impure water is frequently responsible for outbreaks of the above and other diseases is no longer problematic; the subject can now be studied only from the side of practical experience. Finally, the lecturer pointed out the superior advantages of the bill recently introduced into the House of Representatives, having for its object the establishment of a National Health Bureau.—*Cincinnati Medical Journal.*

THE DECREASE IN THE DEATH RATE IN ENGLAND.

NEARLY TWO MILLION YEARS ADDED TO LIFE ANNUALLY. EXTRACT FROM THE ADDRESS OF THE PRESIDENT OF THE PUBLIC HEALTH SECTION OF THE LATE BRITISH MEDICAL ASSOCIATION MEETING, R. P. B. TAAFFE, M. D., F. R. C. S., MEDICAL OFFICER OF BRIGHTON.

PASSING to the next subject I shall touch upon the striking decrease in the death rate of 1871-80. The Registrar-General, in the supplement to the Forty-fifth Annual Report, has shown that the mean annual death-rate in England and Wales in the decennium 1871-80 was 21·7, which was lower than in any preceding decennium since civil registration began ; the death-rate, although varying from year to year, practically remained stationary during the thirty-three years 1838-70, averaging 22·4.

Mr. Noel Humphreys has pointed out "that the mean death-rate of the first two years of the current decade was so low as 19·3."

Now, taking the mean rate of 1883, 19·5 ; 1884, 19·6 ; 1885, 19·0 ; we see that 19·3 is maintained as the average mean death-rate for the first half of the current decade ; this shows a decrease (which, it is hoped, will be continued in the second half) of 1·9, and of 3·1 from the mean rate of 1838-70.

In the Registrar-General's supplement already quoted, Dr. Ogle says :— "There can be no reasonable doubt that the very marked and progressive decrease in the general death-rate is due to the effects of the ever-increasing efforts to improve the sanitary condition of the country ; and that sanitation should have more distinctly affected the mortality of the young than the old is only what might be naturally anticipated, for it is against noxious influences to which the young are more particularly sensitive that the weapons of sanitary reform have been chiefly directed."

Dr. Ogle further says :—"That sanitary administration can do much to lower the mortality of a given place, is indisputable. The very great general decline in the death-rates since the commencement of active efforts to ensure more efficient sanitation is sufficient evidence of this ; as also is the further notable fact, that the decline in the death-rate has been greatest in those parts in which the sanitary administration has been most active—that is to say, it has been greater in the urban than in the rural districts." Again, "The old English life table, based on the mortality of 1838-54, gave the mean after life time, or expectation of life after birth, for males 39·91, and for females 41 85 ; while a life table which has been based on the mortality of 1871-80 gives the expectation of life for males at 41·35, and for females 44·62—that is, an increase of 1·44 for males, and 2·77 for females.

"By the old table one-half of every million males born would be dead before the end of their 45th year ; by the new table half would not have died till after the end of the 47th year—that is, an increase of more than two years.

"By the old life table, half of every million females would have died before the end of the 47th year, whereas by the new life table half would still be surviving at the end of the 52nd year, or an increase of more than five years." Good news this for the ladies !

"The mean life time of males is by the new life table 41·35, whereas by the old it was 39·91 years ; according, therefore, to the new table, a million males would live 1,439,139 years more than would be the case according to the old table. Similarly, a million females would live 2,777,584 additional years."

"The mean annual number of births in England and Wales in 1871-80 was 858,878, and of these births, 437,492 were of males, and 421,386 of females. The additional years lived by this annual number of children, if subject to the reduced rates in the new life table, would be for males 629,612, for females 1,170,435, or for persons including both sexes, 1,800,047."

Mr. Chadwick says : "The changes in the death-rate have given to the community an annual addition of 1,800,047 years of life shared among its members ; and allowing that the changes in the death-rates are the direct consequence

of sanitary interference, we must regard this addition of nearly two million years as an annual income derived from the money invested in sanitation.

"That, in accordance with the experience of the Friendly Societies, for every adult death of the wage classes, there are at the least twenty days of bed-lying sickness, involving the loss of wages during the time; and that, according to Sir James Paget, the insurance of those classes against excessive sickness and premature mortality amount to no less than £25,000,000 annually."

The borough of Brighton has shared in the general reduction of the death-rate. The average death-rate in the two decades 1851-60, 1861-70, was 22·0; in the decade 1871-80 it was 20·2; in the decade 1874-83 it was 20·0; in that of 1875 84 it was 19·3; and in that of 1876-85 it was 19·3, showing a decline in the death-rate of the municipal borough of 2·7 per 1,000, without making sufficient allowance for visitors in the population.

In the year 1885, in the parliamentary borough of Brighton and Hove, the annual death-rate was 16·4; and allowing for an addition to the population of an average of 10,000 visitors (a moderate addition), the death-rate was only 15·2 per 1,000; this latter being the real death-rate per 1,000 of Brighton for 1885. The death-rate for the year 1885 was 13·1, 14·1, 12·9, 12·5, in the Palace, Kemp Town, Preston, and Hove districts respectfully, of the parliamentary borough, no sufficient allowance being made for visitors in the population, which allowance would of course have made the rates lower.

The important conclusions arrived at by the Registrar-General must be my excuse for quoting so largely from his report, conclusions which must prove most satisfactory to the sanitary authorities of the kingdom, and to all persons engaged in practical sanitation, and which doubtless will serve as an incentive to continued efforts on their part.

SUGGESTIONS TO HEALTH OFFICERS.

IN the eighth and last annual report, (1885) recently received, of the State Board of Health of Rhode Island, are some valuable suggestions for health officers. These suggestions for the most part apply chiefly to that State, but the following general remarks which we extract are equally applicable to all countries:—

By Public Statute the town councils of all towns in Rhode Island are required to appoint one or more Health Officers. The office, in actual importance, is scarcely exceeded by any other municipal appointment. Health is the foundation of enterprise, industry, good social order and prosperity. The health officer is the conservator of that foundation, the sanitary sentinel of households and communities, the sentry on guard to give notice of the approach or presence of the foes of health, the emissaries of disease.

A Health Officer should feel the importance of his official position; its dignity and responsibility. Upon his judicious activity, intelligence and discernment, rests in large measure, the future comfort and prosperity of his fellow townsmen and their families.

It is proposed to present some suggestions in relation to the duties and powers of health officers in Rhode Island.

If all health officers were well educated physicians, (who are in all cases better qualified for such positions by reason of their medical training) such suggestions would be less needful.

In the first place the officer should make himself thoroughly acquainted with all the laws of the State having relation to the public health, and also with the ordinances of his own township or city, having the same relation.

The Public Statutes and Laws may be found in some instances somewhat general in terms and phraseology, but for the most part they are specific and clear. Municipal ordinances are usually quite definite and direct.

With a knowledge of the laws and their varied applications well in hand, he is equipped for service. But if not a physician, and without sanitary study or experience, he is like an untrained

soldier, clad in uniform and supplied with arms, but without a knowledge of their best practical use, or who are his foes and where they are to be found. He should acquire possession as soon as possible, of one or more of several valuable works, treating of hygiene and general sanitation. The practical information which he will derive therefrom, will be found not only desirable, but practically almost indispensable.

Nuisances are of various kinds; they may be private or public, they may be injurious to health, or simply offensive. It is the duty and consequently within the province of the health officer to decide what nuisances are prejudicial to health, whether private or public. No person has a legal right to continue in the possession of any property or thing, which is an injury to the property or person of any other individual. An overflowing cesspool, an overfull privy or uncleaned privy vault or foul sink drain, sending out gases deleterious to health, might not be a nuisance dangerous to the health of persons living two hundred yards away, and no legal action would be taken to abate them, though the occupier of the premises might, by continuance of the same, be committing slow suicide and poisoning his family by degrees.

But if the same kind of centres of filth, and foulness to the same extent, were but a few feet or yards from the residence of other persons, legal action could be taken and the nuisances prejudicial to health abated. It is the duty of the health officer, however, to warn all parties of the danger arising from the continued inhalation of the gases arising from any accumulations of putrefying filth whether on their own premises or that of others.

The health officer will find occasion in compact parts of towns, and it will be his duty also, to ascertain the location of any such accumulations of filth, whether in stables, fish houses, slaughtering houses, bone boiling or trying establishments, swine pens, or dumped in or by the highway or in the yards of occupied buildings, and especially in the cess-pools and privies of such compact places. If nuisances likely to cause sickness are found, and the health officer has no authority to abate them, and the owners or occupants of the premises decline to act upon the advice or request of the officer, report should be made to the town council forthwith, and an order for abatement be requested.

* * * * * *

In recapitulation of the duties of health officers, it may be stated that he is expected:

I. To determine what shall be considered nuisances prejudicial to health, to abate the same or report to the town council for orders of abatement.

II. To be diligent in endeavoring to ascertain the sale, or exposure for sale, of meats or vegetables of any kind for food which are unfit and unsafe to be eaten, and to enforce the law in relation to the same.

III. To keep informed of, and to endeavor to ascertain, the cause of any outbreak of epidemic disease occurring in human beings or among domestic animals, and to give notice of the same to the town council and to the Secretary of the State Board of Health.

IV. To investigate the condition of buildings in relation to means of escape in case of fire, and to report such as are unsafe.

V. To give notice to parties liable to suffer in health from well water, taken from wells in the near vicinity of cesspools and privies without water-tight bottoms, and near other accummulations of filth.

VI. To be vigilant in regard to violations of the law in the sale of adulterated articles which are used for food or drink, and in the preparations of food and drink, and which are unwholesome and liable to cause sickness. Adulterated or watered milk should especially receive his attention.

VII. To act promptly in cases of emergency in accordance with Section 6, of chapter 495 of the Public Laws, especially upon the occurrence in his jurisdiction, of cases of small-pox, epedemic cholera, or yellow fever, and also to give notice of the same to the State Board of Health.

The circumstances and suggestions enumerated above, in connection with which and with others which may be suggested to health officers from time to

time, and which may come within their legitimate jurisdiction, will show how almost indispensably useful in every community an efficient health officer can be. And the fact in the presence of any community of a live and intelligent officer of health, and with all its varied directions of service, vigilant and resolute in the full performance of his duties, will of itself be a power for good, in the increased sanitation of such localities by voluntary action on the part of the citizens.

By his activity, public attention will be called to the needs of sanitary work for the prevention of disease; and the knowledge that over and beyond the vigilance and advice, is the strong arm of the law which he can wield, will in itself be such a potent factor in the voluntary accomplishment of needed work, as to render unnecessary, in a large measure, the assistance of law.

The above suggestions are respectfully presented by the Secretary of the Health Officers of Rhode Island, with the hope and belief that they will receive attentive consideration, and that the duties appertaining to their official position will be discharged with commendable fidelity as occasions occur.

FOOD ADULTERATION.

THE SOPHISTICATED ARTICLES, THOSE WHO SELL THEM AND THEIR EFFECTS UPON THE HUMAN ORGANIZATION.

IF the names of all persons who sell adulterated food could be published freely by the local press, it would help much to prevent such sales. Retail dealers themselves would then soon learn to desist from the practice of adulteration after purchase, and also the necessity of purchasing from the wholesale houses, or from those who prepare foods, only pure articles. The plea that selling an impure article of food is only supplying a demand for those which are cheap or low-priced cannot be entertained for an instant. The demand is not for impure articles. For the most part the public try to buy foods at as low a price as they can and get them pure, and do not want the impure at any price—if we make one or two exceptions, such as chicory in coffee. Greed and dishonesty are the foundation for the practice of adulteration.

Butter, on the whole, according to the last report of the Commissioners of Inland Revenue, was found to be good in Canada, yet much of it was not good —not the good wholesome food which everybody in Canada can afford to buy. Indeed no one can afford to buy an impure indigestible article. Good butter is a wholesome, digestible food. When properly made, and from good cream from healthy cows, it is probably the most digestible fat in the human dietary. Improperly made, with foreign or other fat or containing too much salt or caseine, it is less digestible and less wholesome, and to many persons may prove highly injurious, as when the digestive powers are weak and a pure nutritious fat is needed. It is therefore highly important in the interests of public health, as well as of the public purse, that the butter supply of any country be well looked after by the government.

The selling of bad butter is perhaps, for obvious reasons, more excusable on the part of the retailer than the selling of many other more clearly adulterated foods. There is however probably no excuse for John Murphy, of Montreal, selling butter "containing 20 per cent. of other fat;" or for J. B. Smyth, of London, selling an article "rancid and adulterated with foreign fat;" or for C. Neville, of Kingston, selling butter "badly made," containing too much water, caseine and salt. Winnipeg appears to be rather too much afflicted with butter "unfit for food."

Chicory with coffee renders the latter more acceptable to the constitution of some persons, while with others it makes the beverage oppressive to the stomach, and hence much less agreeable and wholesome. Chicory gives a mucillaginous or starchy beverage, and any drink of a mucillaginous character is to some digestive organs unacceptable and not readily assimulated. These facts should

be more generally known; and the public should know what they buy, and a mixture of chicory and coffee should be invariably sold as such—more especially when the former is such an inexpensive substance.

In Prescott, Messrs. Gallagher & Halfin, sold a mixture reported by the analyst as "little better than chicory, containing about 80 per cent. of the root." And the amount of caffeine actually found was very difficult to identify"--or 0.07 per cent. On the whole the samples of coffee were good with the exceptions of adulteration with chicory, peas and cereals.

Tea when good and pure, although it may be consumed in such excess as to be as injurious as alcohol, when taken with much moderation is to say the least quite unobjectionable, and, in this "fast age,"has doubtless a soothing effect upon the human constitution and is promotive of digestion, while possibly it is to a limited extent a substitute for certain elements of food. When however the beverage is made from a mixture consisting of "fragments of tea leaves, many of them being discoloured as if withered," and "sand and dust" and "particles of colouring matter" it is not easy for anyone to say what the effects would be upon the bodily organs; certainly they could be only of an injurious character. Yet according to the reports of analysts, Messrs. John Hope & Co., of Montreal, were the vendors of such a compound, and of many other samples of "tea" not much better, containing from 3 to 6 per cent. of sand, with powdered tea leaves. There were many other samples of a similiar character sold by other vendors, but for the most part containing nothing worse than tea stalks, dust and sand, mostly free from facings. The number of samples, a total of 75, reported even as "good" or "pure" or of "good quality" is strikingly small. Fifty-one samples were reported "free from adulteration;" ten as being more or less adulterated with foreign leaves; one with spent tea leaves; one with sand and dust; one useless for consumption, and one equally so, containing 60 per cent of sand. Samples of "tea dust," examined for the Department of Customs, were seized or refused entry. A sample in bond revealed besides sand, curcuma, Prussian blue and foreign leaves, in very large quantities. J. B. Rousseau, of Quebec, was the vendor of a similar sample.

The effects of sand upon the infusion would probably be nil, or almost so, but an infusion of dust and discoloured and withered leaves would hardly be wholesome or pleasant. Such tea would probably contain various sorts of microbes—living parasitic organisms, which however the heat during infusion would probably destroy. Prussian blue and almost any other coloring matter likely to be used would prove decidedly poisonous. People who consult economy and health buy only the best and most genuine of tea.

Ginger, a much used and valuable condiment, is apparently not easily obtained pure and of good quality; at least about half the samples analysed were adulterated. A sample from Messrs. Jas. Scott & Co., of Halifax, contained 10 per cent. of sulphate of lime, a very injurious ingredient. Flour was found to be the principal adulterant, while many samples contained sand. A sample from C. Donman, St. John, was about one-third "flour and husks;" and another from H. Kennedy, London, was adulterated with 40 per cent. of mixed adulterant, partly farinaceous, strengthened with cayenne pepper."

Mustard, too, an essential of modern life, is no more easily obtained in a good pure state. A co operative store, London, furnished a sample adulterated with foreign substances to the extent of about 60 per cent., coloured with turmeric; and H. Winders, London, another, adulterated to the extent of about 25 per cent., and containing a small proportion of cayenne pepper. W. A. McGee and Samuel Tufts, St. John, were vendors of a mixture containing from 40 to 50 per cent. of flour and turmeric with mustard.

To the outrageous manner in which samples of pepper were found to be adulterated, reference was made last month, and will probably be dealt with more fully on a future occasion.

THE AMERICAN PUBLIC HEALTH ASSOCIATION'S MEETING.

THE fourteenth annual meeting of the above named association, held in Toronto in the first week in October, inst. was much the most important meeting in the interests of the public health that has ever been convened in Canada. Nearly every one of the United States was represented—from Louisiana to Wisconsin, and from California to Maine, and from a large number of them were many members of the association. The eastern provinces of Canada were represented, as was also Manitoba; while there were a number of delegates from Quebec and many from Ontario, no less than five being from Ottawa; Orillia and Windsor were ably represented by their respective medical health officers, as were also many other towns, and lastly, Toronto naturally contributed a large number of members. The attendance of members at the different meetings was good, although there were but few outside of the membership who took advantage of the occasion to obtain of that sanitary knowledge which was being hourly imparted. A few ladies graced the meetings with their presence and were attentive listeners. The meetings were held in Shaftsbury hall, which was central and convenient. Why some of the meetings were held in the large main hall, the acoustic provisions of which are of the worst sort, and where the speakers could hardly be heard at all except by those on a few central front seats, and other meetings were held in the large room of the hall, which was sufficiently large, and where all could hear, is a sort of mystery which the managing committee would do well to explain.

The provisions for entertaining the members were we judge satisfactory. The most prominent of the entertainment's was a conversazione on Tuesday evening at the educational department. The theatre of the building was literally packed full, and a large number of ladies were present. Prof. Daniel Wilson, President of University College, occupied the chair, and welcomed the visitors; and Provost Body, of Trinity College, then opened the meeting with prayer. Hon. A. S Hardy, in the absence of the Provincial treasurer, in connection with whose department is the Provincial Board of Health, extended a cordial welcome to the association, and the mayor made a happy address of welcome on behalf of the city. Dr. Covernton, President of the Ontario Provincial Board of Health, gave a short address, in which on behalf of the Board he expressed their sense of the honor conferred upon them by the holding with them in Toronto the 14th annual meeting of the association. He extended to their American visitors a hearty welcome. He made a graceful reference to the philantrophic object of the association, which was to prevent disease, and traced the origin of the association to the efforts of a few eminent practitioners in New Jersey thirteen years ago.

The President, Dr. Walcott, of Cambridge, Mass., then delivered the annual address, which was received with much applause. He remarked that this fourteenth annual meeting will fill an important chapter in the history of the association which is for the first time assembled within a city beyond the limits of the United States. The original inhabitants of this country seem to have made this city ready for us; they named the spot Toronto, or "a place of meeting." Let us accept the omen. In the pages of a history, which the genius of the author has made as familiar here as it is in the land of his birth, you may read that in the year 1751, Riquet, the so-called "Apostle of the Iroquois," coasting the northern shore of Lake Ontario, reached the new fort of Toronto, and made this record in his experience:- "The wine is here of the best; there is nothing wanting in this fort; everything is abundant, fine and good." One hundred and thirty-five years do not seem to have changed these cheerful characteristics of the spot. The speaker then considered the claims they might make for preventive medicine, and what expectations they were justified in forming for the future. The address was generally regarded as a most admirable one.

A reception was given on Wednesday afternoon by a committee of Toronto

ladies to the lady friends of the members of the association, which was a very pleasant affair. On Thursday about 200 of the members and their lady friends, were driven through and about the city by the City Council, and had a very enjoyable time; and on Friday afternoon they were conveyed by boat to the point of the city water supply on the Island.

The headquarters of the association in Toronto was at the Rossin house, which we suppose was for convenience; though the larger proportion of members outside of Toronto gravitated to the choice, old home-like place, the Queens; where were held too the meetings of the National Conference of State Boards of Health.

On Monday, 4th inst., there was a conference of State and Provincial Boards of Health. They held three sessions in the parlors of the Queens, which were well attended. The first business was the reading of a paper by Dr, Young, Secretary of the Maine State Board of Health, on "A comparative view of sanitary laws, and what changes are needed in those of Maine." After discussion the matter was referred to a committee to codify the laws of the different States and present them at the next meeting. Dr. Abbott, of Massachusetts, introduced the subject, "What precautions should be taken to prevent the bodies of deceased persons from becoming a source of injury to the public health during transportation on lines of public travel?" A discussion followed, after which the whole matter was referred to a committee for consideration. The following questions were submitted on behalf of the Kentucky State Board: 1. What have been the actual practical results secured, outside of large cities and towns, in preventing the spread of scarlet fever, measles, diphtheria and typhoid fever, and how is the co-operation of the medical profession and general public best secured in such work? 2, Should vaccination be made compulsory? 3. How much in regard to preventive medicine can be taught in schools of low grade, and what is the best method of such teaching? 4. What should be the basis of compensation for local health officers.

The State Board of Rhode Island submitted the following question:—"Investigation of the causes of disease—How can State Boards of Health secure the best results?" A committee was appointed to devise a plan for collecting facts, and to report at the next meeting.

On Tuesday, at 10 o'clock, a. m., the first regular session of the association was opened with prayer by the Rev. Mr. Parsons. The Secretary, Dr. Irving A. Watson, of Concord, N. H., read the names of a large number who had been elected to membership by the executive committee; and the treasurer read his report, which showed that the finances of the association are in a very satisfactory state.

A paper, by Dr. Baird, of Wheeling, Virginia, on "Destruction of Night Soil and Garbage by Fire," was read by ex-President Reeves. It described the relative situations of Wheeling, Va., and Bellair, Ohio, the drinking water of the latter place being polluted by the night soil of the former place, showing the folly of the claim that a running stream of water will soon purify itself. The latter town takes its water supply from the river into which the former town pours its night soil. The consequence is that Bellair is made a hot-bed of disease. For the purpose of doing away with the evils, the Wheeling Health Department last spring made a series of experiments in the destruction of night soil and garbage by fire, and they claim that as a result they had found a means of entirely destroying these substances and their power to do evil. Two facts had impressed them: one that the odor was not such an one as all thought it would be; another was the intense heat required to burn it. The result of these experiments will be explained on another occasion.

Dr. Playter, of Ottawa, editor of this JOURNAL, read a paper on "Our Inland Lakes and Rivers, the Disposal of Sewage, and the Spread of Infectious Diseases." He especially referred to recent experiments in London and Berlin, showing the tenacity of life and powers of reproduction in water of the bascilli of certain infectious diseases, and of the danger to water supplies arising from the present practice of pouring

sewage into rivers and lakes, the sewage containing, as it often did, the living germs of disease. Every square mile of Lake Ontario contained the week's accumulation of the sewage of about 65 persons; the water of the lake being only changed about once a week. The paper will be published in full in the next issue of the JOURNAL. A paper on "Toronto Sewers," by Alan Macdougall, Mem. I'st. C. E., was then read, which gave a history of the Toronto sewers. The writer commented at length on the necessity of putting the outfall of the sewage as far away east as possible from the intake crib of the water supply.

Dr. Oldright delivered an address on the influence of sewerage on health. He pointed out that at Frankfort on the Maine, the death rate from typhoid fever had been reduced by improved sewerage from 87 per 100,000 of the population to 27. In other cities similar results had followed from improved drainage and sewerage. He claimed that in Toronto, by proper attention to these matters, the death rate from typhoid fever could be reduced from 65 to 24 per 100,000, or even to 18 and 17.

The Mayor then addressed the meeting, and lengthy discussions on these papers followed, which turned chiefly upon the proposed plan of the Toronto trunk sewers. The concensus of opinion was opposed to pouring the sewage into the lake at the point proposed, which was about four miles from the intake of the water supply.

On Wednesday the names of a large number of new members were read by the Secretary, The executive committee submitted the following as the deliverance of the association in regard to Toronto's sewage system :—"Resolved, that it is the sense of this association that the constructing of an intercepting or main trunk sewer, with an outlet or point of discharge sufficiently distant from the source of water supply to prevent its pollution, is an urgent sanitary necessity for Toronto," which was unanimously adopted.

A telegram from H. P. Gray, Esq., chairman of the Montreal Board of Health, was read, conveying the best wishes of the Montreal Board for the success of the meeting of the American Association, and expressing anticipations of very much good to the cause of sanitary reform from the meeting; also calling attention to the fact that Montreal cremates all of its household refuse and night soil.

A paper by Dr. Allen, of Lowell, Mass, of much value and interest, on the relations between sanitary science and the medical profession, was then read; after which Dr. Hewitt presented the report of the Committee on State Boards of Health, including the subject of "Inter-State notification on the outbreak of small pox, cholera and yellow fever." Much discussion followed this and a number of resolutions were submitted. The Secretary of the Ontario Provincial Board, Dr. Bryce, said that quarantine regulations at the St. Lawrence ports had been perfectly carried out by Canada, and similar regulations were wanted for the North Atlantic ports. It was said that ships were permitted to come into New York and Boston without the necessary quarantine regulations being carried out in regard to cabin passengers. If New York and Boston did not carry out such regulations in regard to cabin passengers Canada would not do so. It must be stated however that Dr. Bryce had no authority for making such a statement. Canada will be above such a course and will doubtless carry out the late improved regulations, trusting that the wisdom of the United States authorities will soon remedy the defect in their quarantinery.

Dr. Holt, New Orleans, president of the Louisiana State Board of Health, pointed out the difficulties in the way of securing the inter-State notification of contagious diseases. Railway corporations, steamship lines and merchants were opposed to it because it interfered with their pecuniary interests by causing restrictions in transport of freight and passengers. Thousands of lives were thus sacrificed to commercial selfishness. It was necessary that the representatives of the States should meet together and agree as State authorities upon a course of action.

Dr. Prince, of Illinois, read a paper relating to the straining of the air as a disinfecting measure, a synopsis of which will be given elsewhere.

Dr. Thornton, of Memphis, read a paper on "Six years of sanitary work in Memphis." He gave an interesting account of the reforms in sewerage, drainage, water supply and removal of garbage in Memphis, carried out during the last few years, resulting in a marked decrease of mortality and diminished violence of the yellow fever epidemics.

Dr. Bell, of the New York *Sanitarian*, presented the report of the committee on the disinfection of rags. He said the importance of the subject was shown from the fact that the value of the rags imported last year was $519,495. In noticing the dangers of introducing epidemics by infected rags and clothing, he adduced numerous instances of cholera and small pox introduced by infected clothes and rags. He referred also to instances where cholera was carried from the United States to Germany in a trunk of clothes, where working people had been given small pox and cholera by handling rags; and where the hands at rags mills in Europe had been infected with diseases of a similiar nature. Attention was directed to the fact that as every European centre was troubled with diphtheria and scarlet fever, the dangers of spreading these diseases by infected rags was very great. The subject was discussed until midnight, when the meeting adjourned.

On Thursday after prayer and some routine work, Dr. Gihon moved that a special committee be appointed on the purity of the water supply, and suggested that Major Charles Smart, U. S. Army, be appointed chairman of the committee.

Dr. Playter, Ottawa, moved, that in view of the necessity of preserving, so far as possible, the inland waters of this continent in a state of purity, and also of the imperfect and unsatisfactory state of public knowledge in relation to the effects of pouring sewage into waters in the proximity of public water supplies, there be appointed a special committee of this association, which shall be requested to consider the question of sewage, and to report at the next ensuing meeting of the association, with the object of mitigating the evils of, and eventually preventing the present common practice of pouring sewage, especially in its pure state, into the nearest stream or body of water. These resolutions were sent, according to practice, to the executive committee, and a special committee was afterwards appointed.

The representatives of State Boards were then called upon to report upon the work of the State Boards, and the condition of the States they represented, since the last meeting. The reports by the delegates showed on the whole a very satisfactory progress in the interests of sanitation. It was almost generally conceded that State Legislatures were approaching a state of more generous recognition of the financial necesssities of State Boards of Health, and State aid was more liberally accorded for sanitary purposes than formerly. The contamination of the water supply by the emptying of sewage into lakes and streams was strongly condemned by a number of the delegates, who earnestly urged the association to take some action with a view to abating this nuisance. These reports and discussions occupied most of the morning session.

Dr. Montizambert described the disinfecting yacht used by the Dominion Government in the Canadian Maritime service. Speaking of the small-pox regulations of the Dominion, he said a regulation providing for the vaccinal protection of cabin passengers on ocean steamships had been passed, but, it would be unfair for Canada to enforce this regulation unless other cities along the northern sea-board enforced a similar regulation.

Dr. Rohe, of Baltimore, read the report of the Committee on Disinfectants. At the last meeting of the association the committee recommended the use of steam under pressure, dry heat, and boiling in hot water for disfecting garments, etc. Dry heat was not a good disinfectant unless the heat had been maintained at 110 cen. for two hours. The committee wished to express its conviction that the use of steam, and especially superheated steam, was the best agent for disinfecting.

Dr. Holt, gave an interesting description of the methods of disinfecting in New Orleans and the use of apparatus for the purpose.

In the evening Dr. Bryce, read a

paper on "Decomposition of albuminoid substances, and some sanitary problems connected therewith." The paper dealt with the necessity of compulsory inspection of food and milk supplies, not in the cities, but at the source from which they came.

Mr. Blue, Sec. of the Bureau of Industries, read a paper on "Food in its relation to the distribution of wealth." Dr. Russell, Medical health officer of Glasgow, Scotland, addressed the meeting and spoke of the working of health boards in that country. A paper, by Dr. Baird, of Wheeling, Va., on "Sanitation in street paving" was next read.

A paper on "The best methods and apparatus necessary for the teaching of hygiene in the Public Schools as well as for securing uniformity in such institutions," by Dr. H. P. Youmans, of the Ontario Board of Health, was then read. The paper dealt exhaustively with the subject, and recommended the organization of a special teaching department for the purpose of giving instruction in hygiene to teachers in Normal and Model Schools; that lectures be given and practical experiments be made in testing water and air, and practical illustrations of the best methods of heating, ventilating, &c., be given in Normal and Model Schools; and that a systematic, thorough and regular inspection of schools under the direction of a competent and responsible officer, be made.

At the Friday morning's session the resolution on vaccinal protection was passed, as follows: "Whereas, it is apparent that there is a diversity of usage at the different ports of arrival as to the examination for vaccinal protection of cabin passengers, said protection being required within a seven years' limit in the St. Lawrence River, and not at all under ordinary circumstances at United States ports; and whereas, it is desirable that uniformity of action should be obtained in this matter at all ports along the seaboard; be it resolved, that, it is the opinion of this association that the examination as to the protection by vaccination of all passengers arriving from Europe, cabin passengers as well as others, should be exerted at all times and in all cases, even if no case of small pox has occurred on the vessel during the voyage.

A resolution to the effect that imported rags were to be regarded as capable of conveying infectious diseases, and recommending that they should be disinfected before being allowed to enter the United States or Canada, was passed.

The resolutions recommended by the State Boards of Health Committee were passed:—providing that each State, Provincial, or Local Board of Health shall furnish information of the existence of cholera, small-pox and other infectious diseases in the locality of such Board to the Boards of Health of neighboring States, or Provinces and to Local Boards in States that have no State Boards; that in the event of positive or definitive information not being obtainable, health officials of one State shall be privileged and justified to go into another State for the purpose of investigating; and that wherever practicable good investigation should be done with the co-operation of the State or Local Health authorities.

The Advisory Council submitted the following nominations of officers for the ensuing year, which were adopted: President—Dr. Sternberg, Major U. S. A., Baltimore. First Vice-President—Dr. C. N. Hewitt, Secretary Minnesota State Board of Health. Second Vice-President—Dr. C. A. Lindsley, Secretary State Board of Kentucky. Treasurer and Secretary—re appointed. Executive Committee—Dr. Baker, Lansing, Mich.; Prof. Johnson, Chicago; Dr. Holt, New Orleans; Dr. Rohe, Baltimore; Col. Haddon, Nashville; and Dr. Montizambert, Quebec.

The President announced the names of the next Advisory Council, and of the Committee on State Boards, both of which comprise a large number of members. Large committees were also appointed on Animal Diseases and Animal food, on Disinfectants and on Incorporation. The following special Committees were also appointed:

Forms of Statistics—Dr. Billings, Baltimore; Dr. Abbott, Elizabeth, N.J. Dr. Baker, New Orleans.

On the Pollution of Water Supplies—Major Smart, Surgeon U.S. Army, Prof. Daniels, Wisconsin, Dr. Playter, Ottawa.

On the Disposal of Garbage by Fire—Dr. Reeves, Wheeling, Va.; Dr. Laberge, Montreal; Prof. Beemer, New Haven, Conn.; Prof. Vaughan, Ann Arbor, Mich.

After votes of thanks to various bodies, the association adjourned, to meet next year in Memphis, Tenn.

THE PUBLIC HEALTH IN CANADA.

THE DEATHS IN AUGUST AND SEPTEMBER IN THE TWENTY-THREE CITIES AND TOWNS

Last month we had to report an unusually high mortality for July; for August we have now to report a number only 35 less than for July—1857 and 1822 respectively for the two months. This mortality for August was at the rate of 34 per 1,000 of population per annum. In Montreal there were 75 less deaths during the month of August than in July, in Toronto, 38 less; and in Quebec 7 less. In Ottawa there were 55 less, bringing the mortality down from 55, as in the previous month, to 35, per 1,000 of population per annum in August. In Hamilton there were 30 more deaths in August than in July, increasing the mortality from 22 per 1,000 (in July) to 31, which is unusually high for Hamilton. In Halifax too the mortality increased in the same time from 58 to 91, or from 18 per 1,000 to 27 per 1,000. In St. Johns, N. B., there was a small increase, from 53 to 59; and in London an increase of from 39 to 44. In Kingston the increase was from 19 in August to 36 in July, nearly double; showing a mortality of about 29 per 1,000 of population per annum. St. Thomas, with only 4 deaths in July, returned 12 in August; Charlottetown, with 14 in July returned 23 in August; Guelph increased from 15 to 23; Peterborough, from 12 to 17; St. Hyacinthe, from 18 to 20, and Galt, from 5 to 18.

It is notable that in the larger cities where the infantile mortality is unusually high, especially during the heat of the summer season, the total death-rate was greater in July than in August, as if the younger lives succumbed quickly to the injurious influences arising from the heat; while in other cities the continuance of the heat produced its most marked effect in August, and most probably upon older children. In these larger cities too there would be a larger proportion of weakly infants which would yield more quickly to morbific influences. As evidence of this we find that, of the decrease of 75 in Montreal, 41 were, so to speak, from diarrhœal affections, and 33 from developmental diseases, debility, teething, premature birth, etc., both more especially diseases of infancy; i. e. there was in that city a decrease from July to August of 41 deaths from diarrhœal affections, and 33 from developmental diseases, making 74 of the total 75. In Toronto there was a decrease in the mortality from diarrhœal affections and developmental diseases in the two months of 25; the total decrease being as above stated, 38. In Ottawa the deaths from diarrhœas decreased from 73 to 31; making 42 of the total decrease in this city, of 55 deaths.

No deaths from small-pox were recorded in August, this being the second month in which there have been none.

From measles there were only 3 deaths, while 8 were recorded in July.

Scarlet fever, which caused 5 deaths in July, seems to have abated also, as there were no deaths from it in August.

From diphtheria the number of deaths were 66, while in July it was 67.

The total number of deaths from zymotics decreased only from 649 to 638.

Although from diarrhoeal affections there was in the larger cities a marked decrease in the mortality, as stated, there was in many other places a large increase. In Hamilton the number of deaths from these causes was more than double in August what it was in July—being 17 and 36 respectively. In Halifax there was an increase from 3 in July to 34 in August; in Winnipeg, from 18 to 27; in London, from 3 to 11; in Kingston, from 1 to 8; in St. Thomas, from 1 to 5; in Chatham, an increase of 5 (none reported for July); Peterboro, from 3 to 6; and in Galt from 1 to 7. In Sherbrooke and Sorel

there was a decrease in the mortality from these diseases. The 23 cities and towns show a total average mortality from these affections alone, for August, of about 10 per 1,000 of population, per annum; about the same as it was in July, although by a misprint it was placed at only 5 per 1,000 in that month. This is indeed a very bad "showing" for the Canadian cities; indicating a bad sanitary condition. In Hamilton and Halifax, as well as in Montreal, Quebec and Ottawa, the mortality from these affections was above the average, of 10 per 1,000. As we have before stated, the summer infantile death-rate from those diseases is a good index of the prevailing sanitary condition of localities; and there is no doubt whatever that by far the largest proportion of these deaths were of young infants.

THE MORTALITY IN SEPTEMBER.

The mortality in the 22 cities making monthly returns of deaths to the Department of Agriculture fell just 20 per cent. in September, as compared with August; or from a total of 1822 deaths in August to 1459 in September. The fall in the mortality in the corresponding period of last year, in the 20 cities then making returns, if we leave out of consideration the exceptional small-pox epidemic in Montreal, from which there was an enormous increase in the death-rate during these two months, was 22 per cent. This year the mortality in August was at the rate of 33 per 1,000 of population per annum, and in September, 26.5; last year, eliminating the small pox cases, it was 30 per 1,000 in August and 22 in September. It may be fairly inferred that, had there been then no small-pox epidemic, many young infants who fell victims to this disease in those two months would have died from some other cause, and the mortality therefore would have been greater than 30 and 22 respectively in the two months, though probably not so high as this year. While there were then 363 less deaths from all causes in September than in August, of this year, there were 254 less from diarrhœal affections alone, or a number a little short of three-fourths of 363.

The marked and invariable rise and fall in the death-rate during July, August and September, are commonly attributed to climatic changes—to the effects upon the human organism of the increased rise and subsequent fall in the temperature of the atmosphere; the truth is, the rise and fall in the mortality are due to the rise and fall in temperature, not upon the human organism, directly, but, first, and principally, upon prevailing insanitary conditions—decomposing organic matter. This is proved by the nature of the diseases which chiefly cause the increased mortality during the hot period.

No deaths from small-pox were reported in September, which is now the third month in which there has been an entire absence of any record of deaths from this disease, and it may be concluded that the Dominion is freed from it once more.

There were only 2 deaths from measles recorded during the month, and not one from scarlatina. Both of these diseases were very prevalent during the winter and spring months.

Diphtheria had not increased, 2 less deaths being reported in September than in August. Of 64 deaths from this cause in September, 11 were in Toronto, 9 in Montreal, 8 in Ottawa, 7 in Sorel, 5 in Hamilton, and in Quebec, St. John, N. B., and London were 4 each.

Typhoid and other fevers were more fatal in September, and caused 41 deaths. In August there were 30 deaths from this cause. Of the September record, 12 were in Montreal and 7 in Quebec, while Toronto, Hamilton and London gave a record of 3 each.

From all the zymotic diseases the total number of deaths for the month was 416, or at a rate of about 8 per 1,000 of population per annum. This is nearly thrice the average in England—where last year it was 2·7—and larger than the average in the Canadian cities.

In reference to the totals in the different cities: of the larger cities, Ottawa, the capital, returns the largest rate of mortality, or about 35 per 1,000 of population per annum. Montreal comes next, returning about 32 per 1,000. Quebec returns 30, Toronto 24, and Hamilton and London each about 20 per 1,000.

MORTUARY STATISTICS.

RETURNS FOR SEPTEMBER.—DEATHS IN THE 23 CITIES MAKING MONTHLY REPORTS TO THE DEPARTMENT OF AGRICULTURE.—CAUSES, RATE, &c.

	Total number of deaths.	Males.	Females.	Deaths from Smallpox.	Measles.	Scarlatina.	Diphtheria.	Diarrhœal Dis's	Fever, Ent. (Typ.)	Fever, Rem'ttant and Intermittant.	Rheumatism.	Total from all Zymotic Diseases.	From Constitutional Diseases.	Local Diseases.	Developmental Diseases.	Violent Deaths.	Estimated Pop'n round numbers.	D'th rate per 1,000 of pop. per annum	Rate, correspon'g month last year.	Rate in July.	Rate in 3 months ending July.	Rate for yr. end'g 30th June, '86.
Montreal	443	235	208	....	1	....	9	97	12	....	2	128	42	140	122	11	165,000	32	90	47.5	40	50
Toronto	209	119	90	....	....	....	11	27	3	....	....	52	35	77	36	9	105,000	24	22	31.5	26.5	25
Quebec	176	90	86	....	1	....	4	25	7	....	1	43	15	53	60	5	69,000	30	35	44.5	37	34
Hamilton	69	43	26	....	....	....	5	18	3	....	....	26	6	23	12	2	41,000	20	17	22	21	19
Halifax	67	31	36	....	....	....	3	9	1	....	....	13	15	26	11	2	39 000	20	20	18	21	20
Winnipeg	48	21	27	....	....	....	2	14	3	....	....	20	6	13	7	2	30,000	20	15	14	12	12
Ottawa	95	54	41	....	....	....	8	22	2	....	....	33	12	21	24	2	31,000	35	21	55	40	26.5
St. John, N. B.	50	28	22	....	....	....	4	13	2	....	....	20	6	13	9	2	30,000	20	20	21.5	21.5	23
London	37	22	15	....	....	....	4	7	3	....	....	15	8	11	3	....	22,000	20	....	21	20	....
Kingston	17	7	10	....	....	....	..	2	....	....	1	3	4	6	2	1	15,000	14	27	15	16	23
St. Thomas	17	7	10	....	....	....	..	8	....	....	....	8	2	6	1	....	12,000	17	13	4	9	14
Charlottetown	14	8	6	....	....	....	..	1	1	....	....	2	6	4	2	....	12,000	14	15	14	12	18
Guelph	13	7	6	....	....	....	..	2	....	....	....	2	2	5	3	1	12,000	13	15	15	11	11
Belleville	18	8	10	....	....	....	..	1	....	....	....	2	3	7	2	4	11,000	20	22	17	16	16
Three Rivers	32	14	18	....	....	....	2	3	2	....	....	7	4	3	17	1	10,000	38	....	42	33	....
Chatham	9	3	6	..	....	....	..	....	1	....	....	1	4	3	....	1	9,000	12	13	15	17	17
Sherbrooke	22	13	9	....	....	....	1	5	....	....	....	6	....	6	9	1	9,000	30	21	36	27	27
Peterborough	18	10	8	....	....	....	1	3	....	....	1	5	3	7	1	2	8,000	27	22	18	20.5	20
Sorel	24	16	8	....	....	....	7	3	....	....	....	11	3	3	6	1	6,000	47	48	50	44	44
Fredricton	16	10	6	....	....	....	..	2	....	....	....	4	3	9	....	....	6,000	30	16	24	25	24
St. Hyacinthe	13	3	10	....	....	....	..	1	....	....	....	1	1	2	7	2	6,000	26	44	36	46	50
Galt	10	4	6	....	....	....	1	5	....	....	....	6	3	1	....	....	6,000	20	16	10	16	17
Hull	42	25	17	....	....	....	2	4	1	....	....	8	7	7	16	4	12,000	40	....	....	....	....
Grand Total	1,459	778	681	....	2	....	64	272	41	....	5	416	190	446	350	53	.....	35	34	35	....	30
London, Eng	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	21	15.5	21	19.7	....
28 English Towns, over 9,000,000 of pop	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	19.7	17.1	19.7	20.5	....

TREATMENT OF OLD AGE.—Prof. Horatio C. Wood, in a clinical lecture delivered at the Philadelphia Hospital, reminded his pupils that old persons often prove very profitable patients, and frequently require advice having for its object the prolongation of life. In this matter there are three points to be especially considered. "First, the protection from untoward influences, from exposure, to which a large proportion of those die who are said to die of old age. An amount of exposure which may be nothing to a young man, becomes a very serious matter to an old one; and one of the best protections from cold is a buck skin jacket. Every one who is seventy-five years of age, and whose physical powers are beginning to fail, should be put into a buck-skin jacket extending from the shoulders to the hips. There is no flannel, silk, or anything else, which will compare with buck-skin in preventing chilling of the body. Chilling of the surface in an old person means a rush of blood to the internal organs, where from weakness of the vaso motor system, and the condition of the vessels, contraction cannot take place, and the congestion is even apt to be followed by pneumonia, or other inflammatory results. Such patients must be especially guarded against exposure to wind. Damp is feared by many, and credited with causing many affections; but where damp has slain its thousands among the aged, high winds have slain their tens of thousands. This caution applies not only to old age, but to all cases in which there is a tendency to cardiac failure. High winds chill the surface, oppress the respiration, and are exceedingly disastrous to the life of any person whose circulation is without power. I need not say anything in regard to preserving the nervous system from all shocks. Fortunately, as the intellectual powers become blunted, so do the emotional energies, and the old man is not so susceptible to emotional disturbances as is the man whose nervous system is unaffected by age. All accidents are, of course, to be carefully guarded against, and all excessive bodily or mental exercise. Remember, excessive is a relative term, and for the weak excessive may be very little. Rest is of great importance. Indeed, old people should spend many hours in bed. 2. The next point is in reference to diet. The food should be light, but nutritious. Stimulating food should be withdrawn. Meat should be used but sparingly. What we start with, to that we must come, in this life. Man, who begins on milk, should in the last years of his life make milk the chief article of his diet. 3. Finally, in regard to medicines. There are two drugs which are of the greatest importance to old persons. These are alcohol and opium. If your patient, approaching his 80th year, can be made an opium-eater, you will in the majority of cases protract his life many months or years. In these cases the opium is to be used carefully, and in such a way that the patient cannot rapidly increase the dose." [These two powerful remedies, especially the former, are doubtless most valuable, but should only be taken under the advice of a competent physician.—ED. H. J.]—"*Selected*," *in Chicago Med. Times.*

EXERCISE AND HEALTH, ILLUSTRATED.—McClellan, the boxing-master at Woods' Gymnasium, in New York city, said recently to the writer: "The doctors couldn't do anything for Mr. —— (once a confirmed invalid). I took hold of him, made him box with me; a very little at first, increasing the amount of the exercise as the weeks went by, until now he is quite recovered, goes to his office every day, and walks up and down town in all weathers. He eats well and sleeps well—it all came along of the boxing." This man used to be surrounded by bottles containing medicine, like an apothecary's clerk in a compounding room. He took something out of one bottle when he got out of bed in the morning, and helped himself from others before and after each meal. The more medicine he took the feebler he appeared. One malady seemed only to pave the way for another, ache followed ache what brought relief to one ailment added to the intensity of another, and he

soon found that thus to seek for health by way of the materia medica was, like the first inhabitants of Arcadia, to chase the sun, which, when they had reached the hill on which it seemed to rest, was still beheld at the same distance from them. It is not intended to cast a reflection upon those estimable and skillful physicians to be found to-day in almost every community, who are quick to recognize symptoms, adroit in lessening pain, and with whom the saving of life is a common incident. But many, perhaps it is safe to say most physicians, do little to encourage the ailing to rely upon their own exertions for relief, rather than upon medicines, which at best can afford but a temporary respite from suffering and disease.—*Writer in Scientific American.*

GELATINE IN FOODS.—The use of gelatine in ice cream, charlotte russe, and other foods is becoming almost universal. It is employed in cases where eggs were formerly used. The nutritive value of pure gelatine has been shown to be very low in the scale of foods. The beef gelatine of the markets that is used by bakers is far from being pure gelatine. It frequently has a very disagreeable fetid odor, and has evidently begun to decompose during the process of manufacture. After thorough drying, putrefaction does not take place as long as it remains dry. Suppose, however, that a gelatine which has thus begun to decompose during the drying process, containing perhaps the putrefactive germs in the dried state, be dissolved in water, and kept in this condition for a few hours in hot weather previous to being used, the result would be rapid putrefaction. This putrefaction would be checked by the freezing into ice cream, but the bacteria causing it are not killed by the low temperature. As soon as the cream is melted or eaten they resume their activity in the body, and may cause sickness. Several cases of sickness have recently come under my personal observation, apparently from such a cause.... It is a well known fact that gelatine is an excellent medium in which to cultivate various kinds of micro-organisms, and if the conclusions here mentioned be correct, it seems that gelatine should be used with great care in connection with food preparation. When used carelessly it may do a great deal of harm, as the above cases show. I wish to impress those who use it with the importance of guarding against its dangers. Gelatine should not be allowed to remain in solution for many hours before using, especially in hot weather. As gelatine is not an essential food, and as in the experiments of the French Gelatine Commission, it was found that soup or jelly made from bones would not support the life of dogs, although the raw bones would, the propriety of adding it to foods may be called in question. When used at all, only the best varieties should be allowed, and such as are free from putrefactive odor. Gelatine is added to oleomargarine by some manufacturers for the purpose of making it hold more water. It is claimed that by its use this compound may be made to hold as much as twenty per cent. of its weight of water.—Report by Dr. Bartley in the *Anti-adulteration Journal.*

ADULTERATION OF CHOCOLATE.—It is no secret that chocolate is one of the most commonly adulterated articles of trade. The many small producers, and the unscrupulous among the larger manufacturers, who make a practice of adulterating the article, have increased their illegitimate profits for years at the expense of the health of the consumers. A very small quantity of the cacao bean imparts a natural taste and perfume to the fraudulent mixtures, and conceals the introduction into the paste flour of such ingredients as ground corn and beans, coffee grounds, tallow (which imparts the necessary oily matter) and the pulp of peanuts from which the oil has been expressed. It is almost impossible to distinguish between the fraudulent mixtures and the genuine goods in the appearance of the tablets, but in the cup the inferiority of the adulterated article is readily discernible. Pure chocolate breaks regularly, leaving a smooth surface. It is of a slightly yellowish tinge, and the particles show crystalline formation. It is oily and possesses the full aromatic flavor of cocoa, and when cooked with water or milk becomes only

moderately thick. Adulterated chocolate breaks irregularly. It is gravelly and porous, of a whitish color, and thickens considerably in cooking, giving forth an unpleasant odor, readily distinguishable from that of the genuine articles. The only protection for the consumer is to buy the product of well known manufacturers. — *California Grocer.*

THE REMEDIES OF NATURE.—In a series of papers on "The Remedies of Nature," an eminent English physician comments upon past and present medical treatment; and though presumably it is the intention of these papers to convey important and timely information to the medical faculty, they furnish at the same time a hint to the patient at large, which, if he be wise, he will hasten to avail himself of. Perhaps it is the author's intention that he should, for at one moment he seems to drop his voice to a whisper while admonishing the fraternity that they must stop dosing and drugging, and at another talks in stentorian tones over their heads warning the public to look to nature rather than to art for relief from all the minor ailments to which humanity is heir. It may, perhaps, be a disappointment to them who have come to lean upon their medical adviser for advice and rely upon him for health, to learn that the effects of fresh air are more potent and enduring than artificial stimuli, and exercise more to be depended on than jalap, attenuations of aconite and belladonna, or even bread pills. He inveighs against the practice, now unhappily prevalent, of attacking the effects or outward signs of a disease instead of the cause or seat of the malady—a practice which sometimes proceeds from ignorance, though it is often adapted to allay the fears of the patient. "A swelling suddenly appears on a man's knee, whereat," says the author, "he flies in alarm to his physician. The latter sets himself diligently to work to remove the swelling, and, to the joy of his patient, succeeds." This, he says, is like stopping the alarm bells which tell us that a fire is broken out. We should be attending to the fire and let the bells ring. The swelling on the man's knee might not, it seems, be a disorder in itself, but only the outward expression of a real trouble existing within—a warning given by nature, and perhaps an outlet, which, if encouraged rather than restrained, might do much to alleviate the disorder of which it is the expression.—*Scientific American.*

SLEEPING WITH THE HEAD LOW.—The practice of raising the head by pillows during sleep is almost universal, but according to Dr. Meuli-Hilty (*Med. Record*), the reverse (or perfectly horizontal) position should be assumed when we go to rest. The Dr. made experiments in his own person, and found that when he slept with his head lower than his feet, he always awoke more refreshed and capable of performing better work than after a night's rest in the usual position. He has continued the practice for four years, and considers it is the correct attitude for sleeping. His idea is that the brain receives more blood and is consequently better nourished, hence more capable of hard work. Congestion of the brain is prevented by the thyroid gland, which he found increased in size so as to make the circumference of the neck nearly two inches greater. He also claims it is a prophylactic against pulmonary phthisis, since the apices of the lungs receive a fuller supply of blood, under gravitation, and are therefore more able to resist disease.—*Canada Lancet.*

I HAVE long noticed that the use of tobacco shows up the moral heart. Can any one but a depraved man believe it is polite to spit tobacco juice in the pure, honest, face of mother earth? Can anything but selfish rudeness poison the air of one's neighbors with the nasty fumes of tobacco? The filthiest spittoon even, is not dirty enough to squirt tobacco juice in. Can any sane man think it is a case of polite manliness to smoke in the presence of a lady? Selfishness and gallantry are always opposed to each other.—PROF. WILLIAMS, in *Cincin. Lanc.*

SLEEPINESS. and lassitude interfering with afternoon work are almost always due either to alcohol or heavy meat lunches.—*British Med. Jour.*

Canada Health Journal,

A MONTHLY MAGAZINE OF PREVENTIVE MEDICINE.

Specially designed for medical and other health officers, heads of families and all interested in promoting the public health. The only Health Journal published in Canada.

Communications solicited on all sanitary subjects Local health officers would confer a favor by sending copies of their reports, brief notices of local sanitar. condition, improvements, or events in any way connected with health.

ALL communications, with remittances or otherwise, should be addressed,

"Health Journal," Ottawa, Can.

A blue cross opposite this indicates that the subscriber to whom it is addressed is indebted for *this year's* subscription (from Jan. to Dec. $1.50) and all such will confer a favor by kindly remitting, for which we shall feel obliged.

We *cannot* undertake to make out accounts and send them by mail or otherwise and only charge $1.50.

All not remitting on receipt of this number, or during this month, must expect to pay $2.00; we must insist on this in common fairness. Physicians pay $3.00 for their Medical Journal, containing no more reading matter than this one.

Will all in arrear please think of this and help us in the work by an *early* remittance.

SEE CLUB RATES to Health Boards and others on advertising page; also, rates with other journals.

ADVERTISEMENTS of unexceptionable character taken to a limited extent, and at reasonable rates—none of patent medicines.

EDITOR'S SPECIAL CORNER.

THE Season for the use of some artificial means of ventilation is at hand. Windows cannot be any longer fully opened as in warm weather. As we have repeatedly stated, provide a way for the removal of the foul or breathed air of a dwelling and the great difficulty is over. The pure, fresh air will find its way into any room where a certain degree of vacuity is caused by the withdrawal of the inner air. The best and simplest means for removing the air from a room is to have an opening made through the upper part of a wall into a warmed chimney flue, or an opening into a warm stove pipe will answer the purpose well. A flaming taper, or even a lighted match will sh w h w strong a current passes out through such opening It is but a simple thing to provide an opening in either of the ways indicated, and the foundation of much and severe illness may be thereby prevented or avoided.

HEATING is closely allied to ventilation. The practise of warming rooms by means of coils or a series of pipes filled with steam or hot water in the rooms is a bad one, unless special means for ventilation be provided, which is rarely the case. It is much the better way, as recommended by the best authorities, to have air warmed by a furnace in the basement or elsewhere and conveyed into the rooms by means of large tin pipes, with "registers." We would strongly recommend our readers not to use those furnaces which do not warm a good supply of air for the rooms, but instead supply hot water and steam in pipes to the rooms. The ventilation is rarely if ever so good as by the hot air furnace, which must be provided with water for keeping the air from getting too dry.

WHERE stoves are used for warming, the "fire on the hearth" stove, manufacturer's chief agency being at 76 Beekman st., New York city, is the best we know of for suitably warming a room. We have used one over two years and it gives great comfort and satisfaction. It is somewhat like one stove inside of another, the cool air from the floor being constantly drawn in below, is warmed, and escapes through a grating at the top, thus keeping up a constant circulation of the atmosphere of the room.

THERE are now in Canada 5,000;000 or more of people. Measures have been taken to find out the numbers of the inhabitants. But about the vital stamina of these people little is known. We do not know how many are born, nor how many die in a year. We do not know anything definite in regard to the longevity of the people, whether 100,000 of the births sustain on the average a population, between 20 and 40 years of age, of 61,000 persons, as is found to be the case in England, or whether they only sustain an average of 39,000 adult persons, between the ages of 20 and 40, as in some cities of England. This is a question of much consequence, which a Government ought to be able to answer. With a system of vital and mortuary statistics, the question could be answered, this knowledge would then be readily obtainable. Such a system is now much needed in Canada.

MR. GRAY, chairman of the Montreal Board of Health, writes that we have placed the population of Montreal too low—160,000—in our mortuary table, and states that it is now 175,000. We observe that in the last (1885) annual report of the department on mortuary statistics just issued, the population is placed at 156,000. This and our estimation is based on the increase during the last decennium—1871-81. It is quite possible the increase in some of the cities has been proportionately greater during the present decade. We are much pleased to learn of the large increase in Montreal. But are not civic authorities very liable to over-estimate their population?

Observations and Annotations.

The *Therapeutic Gazette*, of Philadelphia, had stated that the outbreak of variola in Canada had been allowed by "ignorant and careless municipal authorities" to assume alarming proportions. The chairman of the Montreal Board of Health, Mr. H. R. Gray, wrote to that journal that the authorities were neither ignorant nor careless, that unfortunately, one of the cases from Chicago found its way into a large hospital in which there was a number of orphan children unvaccinated. He then referred to the anti-vaccinating population and said: When the worst came, the sanitary authorities were not afraid to use force, where it would best produce a good moral effect. The officials were armed and their number largely increased, the doors of all infected houses were sealed up, and patrols mounted in front and rear. The services of the good nuns were invoked, and the municipal authorities supplied them with thousands of dollars to take provisions and medical comforts to the houses thus isolated. Every case not susceptible of perfect isolation at home was obliged to go to hospital, and, if the patient would not go peaceably, he was taken by force. Suffice it to say, by the most severe and stringent means one of the most fatal epidemics of modern times was cut short in midwinter."

A New health association, known as the "Association of Executive Health Officers of Ontario," was we are pleased to find organized in Toronto during the first week in October, inst. It should be capable of much good to the health interest of the province and probably will be. It is a pity that in the election of the president of the association there was not unanimity. The president elect, under the constitution adopted, is not elegible as a member of the association, not being a health officer, and we do not see how he can consistently or properly act as president The other candidate, defeated by one vote only, it appears, is an active health officer in the chief city of the province, and if only the interest of the public health had been considered by all he would doubtless have been elected. The course pursued will we fear operate against the usefulness of the association.

The Orillia *Packet* is always vigorous in urging municipal attention to local sanitary needs and it would be well if there were more such local papers. In a late number we find, "The Board of Health should take immediate steps to have Orillia placed in a thoroughly sanitary condition, and the Council enforce their regulations with greater energy than has ever yet been done. Orillia possesses advantages which might bring her into the very front rank of Ontario summer resorts, . . . Summer visitors do not decide where to go without ascertaining whether there is disease in the locality, and of what nature it is. Let the fact that the town is not only advantageously situated, but wholly objectionable from a sanitary point of view, be made known."

The Tennessee Board of Health Bulletin says: The great sanitary want most felt in Tennessee, as every well-informed medical man who gives the subject a moment's thought must answer, is vital statistics—a perfect registration of every birth, marriage and death, occurring in the State; for aside from the great value in aiding often in the just distribution of property and the detection of crime, such a registration would supply a current history of disease, which not only affords a means of comparison by which the past becomes more instructive, but it indicates at short intervals of time the exact state of the public health and the recognized causes acting deleteriously upon it. We in Canada are in precisely the same state, suffer from the same sanitary want.

Dr. Raven, L. R. C. P. etc., in a paper in the *British Medical Journal*, on infectiousness of certain diseases, writes that, the personal infection of diphtheria would seem to be actively exerted on those who are in close attendance upon the victims of the disease, whereas its influence does not commonly spread to others in the same certain way as does the infection of measles, small-pox and other infectious diseases.

At a meeting of the Academy of Sciences, Paris, not long ago, M. Marey presented a work by the chief engineer, Port of Marseilles. The facts collected by the author demonstrates that the cholera epidemics of 1884 85 were aggravated, and spread after violent storms. The epidemics were especially virulent in the localities near the old port. M. Marey's theory that cholera is spread by means of water is also confirmed by the facts exposed in the work.

Notes on Current Literature.

Harper's Magazine for October is quite up to the average, which is enough to write for all acquainted with its past excellence, and who is not, more or less? For over 30 years, near upon 400 months, we have looked forward with pleasure to receiving this regular monthly visitor, until it has become an essential and dear old friend. From the frontispiece, "Pericos Odi," a charming little piece, to the end of the "Editor's drawer," the October number is filled with sketches, poems and story. We find "Autumn in England," illustrated; "Indian Summer," a poem; and "The Story of Tanis," illustrated, which are worth more than the price of the magazine. The serial stories make satisfactory progress, and the editorial pages afford some food for reflection.

THE Autumn *Century*, October, is a superior number, especially interesting to Canadian readers; indeed what number is not so? Clarence King contributes a striking paper on "The Biographers of Lincoln," illustrated with full page portraits of Nicolay and Hay. The frontispiece is a portrait of the liberal statesman of Norway, Bjornstjerne Bjornson, and the illustrated article of H. L. Brackstad with reference to his greater prominence as a writer is entitled "A Norwegian Poet's Home." With the begining of the autumnal gales, the stirring article of Franklin H. North 'handsomely illustrate' on "The Gloucester Fishers," has a seasonable interest. Captain J. W. Collins,, in "Open Letters," discusses "The Outlook of the Fisheries.' Matthew Arno'd contributes a paper on "Common Schools Abroad,' which in a forcible if indirect way gets at the root of the American as well as English faults in common school education. President Gilman, of John Hopkins University, writes of "Handcraft and Redcraft," and makes a plea for the former in the educational system. Charles de Kay recounts the efforts of "The Ursclines of Quebec" to civilize and Christianize the Indians. In "Europe on Nothing-certain a Year," Mary Wetherbee describes the joys and hardships of a European sojourn when the source of income was literary effort which proved precarious. Mr. Stockton completes his inimitable novelette, "The Casting Away of Mrs. Lecks and Mrs. Aleshine," and Mr. Howell provides Lemuel Barker with a new employment and a quarrel with 'Manda Grier in the ninth part of the "Minister's Charge." The short stories of the number are very good.

ST. NICHOLAS for October is almost a series of climaxes, and is the last number of the present volume and a most excellent one. A glance at the prospectus will make it clear that it is not meant to allow the magazine to fall off in interest during the coming year. And the continued stories and articles just completed are to be closely followed by attractive features promised for the succeeding volume.

HARPER'S BAZAR AND WEEKLY never flag in highly interesting reading matter and, especially, in illustration, often very amusing. The last *Bazar* contains a fine engraving, "God or Mammon," with a poem, and every number contains highly instructive articles, frequently relating to health. In the last *Weekly*, Oct. 16, is a good, double page illustration, "Painting the Town Red," and representing a troop of mounted "cowboys" riding through the streets of a busy city. An article by G. O. Sheilds puts in a plea for the "boys," who as a class are "running over with wit, merriment and good humor," and contends that a constant communion with nature and the study of her broad pure domains tend to make young men honest and noble. "If every young man reared in town or city could have the advantage of a year or two of constant study of nature, we should have more honest men."

PRINCIPLES and practice of hygiene, for the school and the home, together with so much of anatomy and physiology as are necessary to the correct teaching of the subject, by Ezra M. Hunt, M, A., M. D., Sc. D., tenth president of the American Health Association, secretary of the State board of health of New Jersey, and instructor in hygiene in the New Jersey State normal school. This promises to be an admirable and practicable little book, and appears to be well calculated to fulfill the work for which it is designed.

REPORT on the sanitary state of the city of Montreal, for the year 1885, by Dr. Louis Laberge, medical health officer. This is a volume of over one hundred pages, to some points of which we shall probably refer in the next number of the JOURNAL.

OFFICIAL catalogue of the Canadian section of the Colonial and Indian Exhibition, London, 1886, published under the authority of the Hon. Sir Charles Tupper, G. C. M. G, C. B., (High Commissioner for Canada in England), The Executive Commissioner. This contains an introductory chapter on Canada, with maps, and is a valuable reference compend.

ABSTRACT of the Return from Canadian cities to the Department of Agriculture of mortuary statistics for the year 1885. We propose commenting on this report at length in our next issue.

REPORT of the Minister of Agriculture for the Dominion of Canada for the calendar year, 1885, including the Canadian quarantine reports to which we shall refer in the next number of the JOURNAL.

FIFTH annual report of the state board of health of New Hampshire, for the fiscal year, ending April 30, 1886. This contains over three hundred pages of valuable practical matter.

THIRTEENTH annual report of the secretary of the state board of health, of the State of Michigan, for the fiscal year ending Sept. 30, 1885. As usual this one is full of profitable reading.

FORTY-FOURTH report relating to the registry and return of births, marriages and deaths in the commonwealth of Massachusetts for the year ending December 31, 1885. Together with the returns of libels for divorce, and to the returns of deaths investigated by the medical examiners.

FREE GRANTS, PRE-EMPTIONS, ETC.

How to obtain them in the Canadian North-West.

DOMINION LAND REGULATIONS.

Under the Dominion Lands Regulations all Surveyed even-numbered sections, excepting 8 and 26, in Manitoba and the North-West Territories, which have not been homesteaded, reserved to provide wood lots for settlers, or otherwise disposed of or reserved, are to be held exclusively for homesteads and pre-emptions.

HOMESTEADS.—Homesteads may be obtained upon payment of an Office Fee of Ten Dollars, subject to the following conditions as to residence and cultivation:

In the "Mile Belt Reserve," that is the even-numbered sections lying within one mile of the Main Line or Branches of the Canadian Pacific Railway, and which are not set apart for town sites or reserves made in connection with town sites, railway stations, mounted police posts, mining and other special purposes, the homesteader shall begin actual residence upon his homestead within six months from the date of entry and shall reside upon and make the land his home for at least six months out of every twelve months for three years from the date of entry; and shall, within the first year after the date of his homestead entry, break and prepare for crop ten acres of his homestead quarter section; and shall within the second year crop the said ten acres, and break and prepare for crop fifteen acres additional: making twenty-five acres; and within the third year after the date of his homestead entry, he shall crop the said twenty-five acres, and break and prepare for crop fifteen acres additional—so that within three years of the date of his homestead entry, he shall have not less than twenty-five acres cropped, and fifteen acres additional broken and prepared for crop.

Land other than that included in Mile Belt, Town Site Reserves, and Coal and Mineral Districts, may be homesteaded in either of the three following methods:—

1. The homesteader shall begin actual residence on his homested and cultivation of a reasonable portion thereof within six months from date of entry, unless entry shall have been made on or after the 1st day of September, in which case residence need not commence until the first day of June following, and continue to live upon and cultivate the land for at least six months out of every twelve months for the three.

2. The homesteader shall begin actual residence, as above, within a radius of two miles of his homestead, and continue to make his home within such radius for at least six months out of every twelve months for the three years next succeeding the date of homestead entry: and shall within the first year from date of entry break and prepare for crop ten acres of his homestead quarter section; and shall within the second year crop the said ten acres, and break and prepare for crop fifteen acres additional making twenty-five acres; and within the third year after the date of his homestead entry he shall crop the said twenty-five acres, and break and prepare for crop fifteen acres additional, so that within three years of the date of his homestead entry he shall have not less than twenty-five acres cropped, and shall have erected on the land a habitable house in which he shall have lived during the three months next preceding his application for homestead patent.

3. The homesteader shall commence the cultivation of his home tead within six months after the date of entry, or if the entry was obtained after the first day of September in any year, then before the first day of June following; shall within the first year break and prepare for crop not less than five acres of his homestead; shall within the second year crop the said five acres, and break and prepare for crop not less than ten acres in addition, making not less than fifteen acres in all; shall have erected a habitable house on the homestead before the expiration of the second year, and on or before the commencement of the third year shall have begun to reside in the said house, and shall have continued to reside therein and cultivate his homestead for not less than three years next prior the date of his application for patent.

In the event of a homesteader desiring to secure his patent within a shorter period than the three or five years, as the case may be, he will be permitted to purchase his homestead, or homestead and pre-emption, as the case may be, on furnishing proof that he has resided on the homestead for at least twelve months subsequent to date of entry, and in case entry was made after the 25th day of May, 1883, has cultivated thirty acres thereof.

PRE-EMPTIONS.—Any homesteader may, at the same time as he makes his homestead entry, but not at a later date, should there be available land adjoining the homestead, enter an additional quarter section as a pre-emption, on payment of an office fee of ten dollars.

The pre-emption right entitles a homesteader, who obtains entry for a pre-emption, to purchase the land so pre-empted on becoming entitled to his homestead patent; but should the homesteader fail to fulfil the homestead conditions he forfeits all claim to his pre-emption.

The price of pre-emptions, not included in Town Site Reserves, is two dollars and fifty cents an acre. Where land is north of the northerly limit of the land grant, along the main line of the Canadian Pacific Railway, and is not within twenty-four miles of any branch of that Railway, or twelve miles of any other Railway, pre emptions may be obtained for two dollars per acre.

Payments for land may be in cash, scrip, or Police or Military Bounty warrants.

TIMBER.—Homestead settlers, whose land is destitute of timber, may, upon payment of an office fee of fifty cents, procure from the Crown Timber Agent a permit to cut the following quantities of timber free of dues: 30 cords of wood, 1,800 lineal feet of house logs, 2,000 fence rails, and 400 fool rails.

In cases where there is timbered land in the vicinity, available for the purpose, the homestead settler, whose land in without timber, may purchase a wood lot, not exceeding in area 20 acres, at the price of five dollars per acre cash.

Licenses to cut timber on lands within surveyed townships may be obtained. The lands covered by such licenses are thereby withdrawn from homestead and pre-emption entry, and from sale.

INFORMATION.—Full information respecting the land, timber, coal and mineral laws, and copies of the regulations, may be obtained upon application to THE SECRETARY OF THE DEPARTMENT OF THE INTERIOR, Ottawa, Ontario; THE COMMISSIONER OF DOMINION LANDS, Winnipeg, Manitoba; or to any of the Dominion Lands Agents in Manitoba or the North-West Territories.

A. M. BURGESS, Dep. Minister of Interior.