

THE DOMINION
SANITARY JOURNAL

DEVOTED TO THE
PUBLIC HEALTH

AND KINDRED SCIENCES.

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CONSUMPTION—ITS CAUSES AND PREVENTION.

Consumption is such a fearfully prevalent and fatal disease in almost every country in the world that hardly any question can be of greater importance than that which relates to its prevention. It is a question which concerns every individual, of every age, high, low, rich and poor, almost alike, for no one can be said to be exempt from the disease or its influence. Moreover, the disease seems to be every where on the increase, which fact makes the question a still more serious one. Finally, the disease is undoubtedly preventable, and the subject of its prevention becomes one of great practical importance.

A great many people, even amongst the more intelligent classes, look upon consumption, as they do upon many other diseases, as something to which human beings are so naturally subject that they are powerless in preventing it; yet, when once symptoms of its presence become manifested in the body of any one, there is not the slightest hesitation in at once resorting to means for its cure. Any one of ordinary intelligence who will examine into the now well known causes of consumption cannot fail to readily see that it is not only a preventable disease, but that it may be more surely prevented than the actively infectious diseases which prevail epidemically: because the prevention of consumption is, in each individual case, practically almost entirely in the hands of the individual, whereas, in the case of any one of the very infect-

ious diseases, any individual is liable to become infected from other persons who, through ignorance or wanton carelessness, may convey the infection of it to him. Consumption is now almost universally regarded by the medical profession as a preventable disease.

THE MOST FATAL AND COSTLY DISEASE.

The record of deaths in the province of Ontario since the year 1870, shows that many more deaths are caused by consumption than by any other disease. It causes on an average more than one-tenth of all the deaths registered in the province. In Nova Scotia, from a record of deaths collected there a few years ago, it causes about one-fifth of the deaths in that province. In Great Britain and in some of the United States it is nearly or quite as fatal.

From the long period of debility, sickness and inability to work which invariably precede death from this disease, the actual costs of the disease to the country, aside from the deaths, is vastly greater than the costs of any other disease; the proportion, on comparison with other diseases, being much greater in regard to the sickness than to the deaths.

It is somewhat strange, considering the great fatality of this disease and the large proportion of deaths it is continually causing in almost every civilized country, that more general attention has not heretofore been given by sanitarians to its prevention. Those interested in public health proceedings—in the prevention of

sickness and premature deaths—have perhaps naturally enough bestowed almost their whole thoughts and time, given in this behalf, to those diseases which prevail epidemically and in a short period of time destroy many lives, or which prevailing only endemically or to a much less extent, destroy life more rapidly—in a few days or a few weeks, while this dreadful disease, consumption, which is daily cutting off, after months and years of hopeful, yet mostly hopeless suffering, vast numbers of lives—often the brightest, most useful, most valuable lives, has not received from practical sanitarians, that practical consideration which its great importance demands.

THE DISEASE IN ANIMALS.

Tubercular consumption effects many if not all of the domestic animals, more especially, in this country, cows and fowls. It may not be very common; some assert that it is not. But no investigations have been made, and it may, in view of its prevalency in other countries, be more common here than is generally supposed. Enquiries are being made at the present time by the publishers of the *SANITARY JOURNAL* in reference to the prevalency of this disease in some of the domestic animals in this country, and the results of the enquiries will be made known in a future number.

CAUSES OF CONSUMPTION.

The causes of consumption may be best considered under three principal heads, viz: heredity, contagion, and personal habits and the surroundings of life.

Probably in every case of consumption each one of these causes has taken part in the development of the disease—each, in a degree small or greater, according to circumstances. Some constitutional defect in connection with the respiratory organs has been inherited, it may have been from ancestors somewhat remote, or apparently so, and the defect may have been but slight at first and gradually developed and in-

creased by habits of life. The specific contagion—the tubercle bacillus itself, it may be, is then received into the body from another case of the disease, for there can be hardly any doubt that the disease is contagious, and it appears very probably that the bacillus is the contagious principle. The condition of the body proves suitable for the development and multiplication of this contagion, and probably habits of life and environments favor its multiplication until it becomes as it were “master of the situation”—the human organism, divine, is overcome and its life destroyed by the microbe.

HEREDITY.

The influence of heredity in consumption appears to be greatly misunderstood, especially by many outside the medical profession. Consumption can hardly be regarded as hereditary in anything like the same degree, or even in the way, that syphilis is. It seems improbable that there is anything more transmitted from parent to offspring than certain constitutional or structural defects in bodily organization; and these defects are probably chiefly connected with the respiratory organs. It has been stated that in the inherited tubercular diathesis, the minute lymphatic vessels are smaller than in persons of sound vigorous constitutions; whether as cause or effect is not known. Might not the diminished caliber of these vessels be the result of imperfect respiratory capacity, with imperfect performance of the excretory functions? Practically, this is a matter of comparatively little consequence.

The following extracts bearing upon this are deductions from a report on causes of consumption, compiled from answers, by medical practitioners, to a series of questions sent out by the editor of this *JOURNAL* about three years ago, which answers were based upon over 250 cases of well marked tubercular phthisis which came under the observation of these

medical practitioners, in Canada and the United States.

"In causing consumption, in so far as configuration and structure of the body, and the relation, and the relative size and vigor, of different organs to each other, are influenced by parentage, hereditary influence becomes a very important factor. Indeed, heredity probably has no direct influence whatever, at the periods of life above mentioned (after the period of childhood), other than in this way.

"Man is made up of the characteristics and peculiarities, physical, mental and moral, of his ancestors; more largely of those of his parents than of his grand parents. In organic life like produces like, and form, general structure, features, are, by the laws of life, man's sure inheritance—subject, to be sure, to the influences of the conditions and circumstances by which he is surrounded. We can, therefore, but expect and look for constitutional or organic defects to be transmitted from parents to offspring.

"One of the most marked features, and perhaps the most important one, brought out in the analysis of the cases, is the evidence that those who die of the disease under consideration have a small pulmonary capacity—a small, contracted chest. This is shown not only in the average of the cases, but in every case; in not one did the circumference of the chest even approximate that of a well developed individual of the same height and weight.

"According to the best authorities the circumference of the chest around or on a level with the nipples should be, for good development, equal to one-half the height, plus one-fifteenth the height, of the individual. The circumference of the chest, therefore, of one whose stature is 5 feet $5\frac{1}{2}$ inches—the average height of the cases above reported upon—should be, according to that, at least 37 inches; whereas the average circumference of the chest in these cases was only $31\frac{1}{2}$ inches, or only about five-sixths of that demanded

by health and good natural development.

"In about half the cases the chest was flat as well as small in circumference—a form giving still less capacity than a round chest with the same circumference. It may be fairly assumed that the average depth or length of this cavity in these cases was not greater, if so great, as the depth of it in well developed persons. True, in the larger proportion of cases the trunk seemed proportionately long, but most likely this length was owing to a long abdominal cavity, as in most of the cases the function of digestion appears to have been well performed, indicating well developed digestive organs.

"Now, as the size of the lungs is in exact relative proportion to the size of the chest, the lungs with the heart and its large trunk vessels just filling the cavity, and though it is possible that small lungs may be more highly organized than larger ones, as doubtless is the case with other organs, especially the brain—that the air cells in the smaller lungs may be, relatively, more numerous than in the larger ones, and so give a relatively greater respiratory surface, we have no evidence that this is the case, and though this condition might prevail to a certain and limited extent, there was, doubtless, in all these cases, a great want of capacity for the purposes of carrying on the important function of respiration—that by which oxygen is taken into the blood and the used up waste matters are given out. There would be, consequently, in such circumstances, besides want of stamina, a tendency to accumulations in the blood and other fluids of the body of waste, used-up matters, and frequently probably, too, of unassimilated though digested food.

"Furthermore, they had nearly all been small or moderate eaters, and had used but little fatty food except butter (most healthy people use besides butter a good deal of fat); they could not, in

fact, seemingly, consume enough oxygen to utilize the digested products of a generous or full diet, especially that containing much carbonaceous matter. They had, consequently, no natural desire for more than a small or moderate quantity of food. But few of them, as we find, suffered from indigestion; they could, for the most part, readily digest all the system could utilize with its small respiratory capacity—all there was a natural inclination for. It is frequently the case that persons predisposed in this way to pulmonary consumption have a desire for and will digest very indigestible foods, such as pastry and hot bread."

RECENT RESEARCHES ON THE MICRO-ORGANISMS OF DIPHTHERIA.

BY DR. FRIEDRICH LEFFLER. EXTRACTS FROM REPORTS OF THE IMPERIAL BOARD OF HEALTH OF GERMANY.

Nearly sixty years have passed since Bretonneau published his classical treatise on diphtheria, yet notwithstanding the efforts of the long series of workers who have followed in his footsteps, the true aetiology of diphtheria has never yet been satisfactorily established. The varied circumstances under which the disease has been observed, have led to a variety of views upon the subject. Perhaps in one point only is there any complete agreement, and that is, its infectiveness. The analogy of other infective diseases, in which a definite micro-organism has been discovered, naturally points to the probability of a similar discovery in diphtheria, and the researches of many observers have been concentrated directly upon this one point in the aetiology.

Dr. Loeffler prefaces the account of his own experiments by a concise summary of the work done by his predecessors in the same field. One of the most important observations which has of late years aided the elucidation of the problem, was published by Dr. Heubner during 1881.

Following the line of experiment opened up by Oertel, Weigert and others, Heubner succeeded in producing false membranes upon mucous surfaces by means of mechanically modifying the circulation in the blood-vessels supplying the part. He then injected portions of true diphtheritic membrane into the general circulation, and found that some form of poison became concentrated in these artificially produced membranes, rendering them capable of re-infecting healthy animals with a genuine diphtheria. The general outcome of his work appeared to be, that the local affection was most probably the starting-point of the disease and the seat of the development of the poison. Arguing by analogy, therefore, it must be assumed (1) that certain typical organisms must be present in the affected spots; (2) that these organisms must be capable of isolation and re-cultivation; and (3) that the disease must be reproducible from these cultivations. Heubner, however, failed to prove the constant presence of any definite micro-organism other than the very numerous micrococci which, according to his theory, ought to be found within the blood-vessels leading to the affected spots. Klebs, on the contrary, found a definite bacillus somewhat smaller than that of tubercle in the upper layer of the diphtheritic membrane in all the cases which he examined.

Dr. Loeffler gives his own experience in detail, particulars of each individual experiment being recorded, the method of staining employed, &c.

Summing up the results of his observations, he states his conviction that the whole process is one of necrosis, due to the ingrowth of the micrococci, and that the presence of so many other forms of micro-organisms is simply due to the fact that the decomposing tissue forms an excellent soil for the development of any kind of organism that may find its way into the air passages.

Two distinct varieties, however, are

undoubtedly to be associated with the diphtheritic process, viz.—the chains of micrococci and the single bacillus first observed by Klebs. The former of these were always found in the cases where a distinct loss of substance had taken place, not only on the surface, but also pushing their way into the tissues beneath, and so to the lymph glands and the internal organs.

Having thus established the fact that these two varieties are commonly associated with the local changes in diphtheria, Dr. Loeffler proceeded to verify and expand his observations by means of cultivation and infection of animals. With the cultivated specimens of the chain-forming micrococcus, the results of infection were for the most part negative, and the author arrived at the conclusion that their presence must be regarded as only an occasional accompaniment of the disease, and not as an active element in its production. With the cultivations of the bacillus, however, the results were more decided. By successive cultivations he effectually isolated them and obtained them, free from other bacteria, in a fluid, consisting of a mixture of three-parts of calf or sheep's blood serum, and one part of neutralised veal-broth, to which was added 1 per cent. of peptone, 1 per cent. of grape sugar, and one half per cent. of common salt. The bacilli were motionless, staining rapidly and deeply in methyl blue. Some were straight and slightly bent, their average length being about equal to that of the tubercle bacillus, though somewhat wider transversely. A dark deeply-strained spot at one end of the rod was observed by Klebs, and thought to represent a spore. Dr. Loeffler, however, who also observed it, failed to find any sufficient evidence of this. The results obtained by infection experiments were remarkable. Although mice and rats appeared to be unaffected by the bacilli, he found that guinea-pigs were very

powerfully attacked; distinct false membranes were, in many cases, formed about the seat of puncture, profound disturbance of the internal organs being induced by the poison. Inflammatory œdema of the subcutaneous tissue, local hæmorrhage and general serious effusion were found in the majority of cases. No bacilli, however, could be detected in any other part than the immediate seat of inoculation. These experiments place the fact beyond doubt that the fatal affection of the internal organs is due, not to the local action of the bacilli circulating within them, but to the influence of some poison, probably set up by the bacilli at the primary point of infection.

Upon rabbits the effects of inoculation although present, were less marked. In pigeons, a very distinct membrane was produced about the seat of puncture, whether in the breast or in the trachea itself. The bacilli introduced through the mouth into the unwounded larynx produced no effect whatever. Similar results were obtained with like experiments on fowls. Some curious phenomena were observed in the cases of two pigeons and one fowl, in which an apparent diphtheritic paralysis had been induced. In two cases there were found abundant deposits of uric acid (which, by the action of methyl blue, were stained a bright red), and these had evidently set up an arthritis of several joints, whilst in the third a myxomatous tumour was found pressing on the spinal cord. Dr. Loeffler's paper is concluded by some observations upon diphtheria in pigeons and in calves. The main practical point which comes to the front as the result of his investigations is this, that the diphtheritic process is essentially local in its early stages, and that the poison which exercises its disastrous influence upon the body generally, is developed at the original seat of attack. Hence the paramount necessity of isolation and of disinfection of all discharges

from the air passages. The treatment which this view of the disease indicates must, therefore, be mainly directed towards the removal or neutralisation of the infective materials, or that portion of mucous membrane which may be in the first instance attacked.

THE LONDON INTERNATIONAL HEALTH EXHIBITION.

SEWAGE DISPOSAL.

There are three typical exemplifications of processes of sewage disposal at the Exhibition: that adopted by the Manchester Corporation, Moulès earth system, and an exhibit of the A B C process carried out at Aylesbury.

Manchester has for the past ten years adopted a "pail system," keeping all refuse matters as far as practicable out of the sewers, and has been able to manufacture a saleable manure and other products. The excreta are received into a pail, and mixed with fine ashes; this mixture is effected by the ashes being shot against a sort of sifter, the fine ash-dust falling into the pail, the coarse into a special receptacle. The pail is of steel, of a special construction, and provided with a caoutchouc rim, on which a cover is securely and hermetically clamped by a simple arrangement; the pails will hold about ten gallons, and are removed daily or at longer intervals, according to circumstances, in a collecting van, which has two compartments, one for the pails, another for house refuse. The quantities annually dealt with by the Corporation are as follows: Fish, bones, dead animals—dogs, cats, &c.—boots, hats, &c. 137 tons; Slaughter house refuse, 1,205 tons; Human excreta, 31,817 tons; Vegetable matters—cabbages, potatoes, straw, &c., 38 tons; Wet and dry cinders, 36,210 tons; Domestic dust, 11,932 tons; Glass and stone bottles, broken pots, mortar and brickbats, 480 tons; Rags, paper, iron, wire, and tin, 110 tons; making a total of 82,019 tons.

The several matters are dealt with as follows:—The animal matters, deprived of fat, which is worked up into soap, grease, &c. are treated with sulphuric acid to fix the ammonia; the dried mass is then broken up, powdered, and sold to the farmers as manure. The excreta are treated similarly. A model of the machines by which the drying and grinding is effected is exhibited. The cinders are used in the furnace fires, in order to effect the evaporations. Rags, paper, iron, wire, and tin, are sifted out and sold. Some of the refuse is made into bricks, mortar and concrete. Samples of all the manufactured products are on exhibition.

Manchester has adopted this system for ten years, and is satisfied with it. The death-rate is high-fluctuating between 24 and 25 per 1,000, but the old death-rate previous to the adoption of the system was 33 per 1,000, and at that time there were 60,000 cesspools.

The earth closets have been lately improved, and as now made are in action automatic, a hopper is charged with earth, and by either pulling a handle or by the mere act of rising, a certain quantity of earth is thrown into the pail. There is a model of an upstairs closet; by a lift arrangement earth can be conveyed to the closet from behind, so that it is unnecessary for the requisite supply of earth to be conveyed up the stairs; in the same way the pail receiving the excreta may be removed.

The system as applied to schools is exemplified by means of a model. This system is a very cleanly good system for isolated houses or small communities; it has been in use at the Charter House School, Godalming, for some years; at the Board Schools, Sutton; at New College, Oxford, and at Girton College, Cambridge, and it appears to meet with the approval of the managers of these establishments.

The A B C Process for the disposal of sewage is exhibited in a detached build-

ing by the Native Guano Company. This process has been in operation at Aylesbury for eight years, at a net cost to the town of 250*l.* a year. This town differs in regard to its sewage from other towns of a similar size, in the enormous quantities of waste liquid from tanneries. The sewage is all concentrated into one point, is pumped into a reservoir, mixed with blood, charcoal and clay, and precipitated with sulphate of alumina; the precipitate is allowed to settle completely, and the supernatant fluid, perfectly colourless, is supposed to be in a condition to flow into a river without polluting it. The precipitate is dried and worked up into a saleable manure.

DAMP CELLARS AND HOW TO PREVENT DAMPNES IN THEM.

The time will probably come when there will be no such thing as a cellar under a dwelling house, when houses will be built up on arches, with a free circulation of air under the floors. In the mean time the best must be made of the cellars. The best remedy for damp cellars is, undoubtedly, to have the soil under and around the house deeply under-drained. The drains or tiles should be two or three feet at least below the floor of the cellar, so that the standing soil water could not reach the floor. This plan should always be adopted when possible.

A correspondent inquires of the editor of the *American Architect* (*Scientific American*) what remedy he would suggest for curing a damp cellar.

The difficulty to be overcome in a new house is the wet cellar. Conditions present, concrete not strong enough to resist the hydraulic pressure through a clay soil. No footings under wall (which are of brick). No cement on outside of wall. The water evidently, however, forces its way through the concrete bottom.

(a) Will reconcreting (using Portland cement) resist the pressure of water and keep it out?

(b) If not, will a layer of pure bitumen damp-course between the old and new concrete do the work?

(c) Will it do any good to carefully cement the walls on the inside with rich Portland cement, say 3 feet high, to exclude damp caused by capillary attraction through the brick wall?

In reply to the above queries the editor gives the following hints, which are equally applicable to builders of new houses as to those occupying old houses with damp cellars:

It is doubtful whether even Portland cement concrete would keep back water under sufficient pressure to force it through concrete made of the ordinary cement. The best material would be rock asphalt, either Seyssel, Neufchatel, Val de Travers, Vorwohle, or Limmer, any of which, melted, either with or without the addition of gravel, according to the character of the asphalt, and spread hot to a depth of three quarters of an inch over the floor, will make it perfectly water tight. The asphalt coating should be carried without any break 18 or 20 inches up on the walls and piers, to prevent water from getting over the edge; and if the hydrostatic pressure of the water should be sufficient to force the asphalt up, it must be weighted with a pavement of brick or concrete. This is not likely to be necessary, however, unless the cellar is actually below the line of standing water around it.

This, although an excellent method of curing the trouble, the asphalt cutting off ground air from the house, as well as water, will be expensive, the cost of the asphalt coating being from 20 to 22 cents a square foot; and perhaps it may not be necessary to go to so much trouble. It is very unusual to find water making its way through ordinary good concrete, unless high tides or inundations surround the whole cellar with water. If the source of the water seems to be simply the soakage of rain into the loose material

filled in about the outside of the new wall, we should advise attacking this point first, and sodding or concreting with coal tar concrete, a space 3 or 4 feet wide around the building. This, if the grade is first made to slope sharply away from the house, will throw the rain which drips from the eaves, or runs down the walls, out upon the firm ground, and in the course of two or three seasons the filling will generally have compacted itself to a consistency as hard or harder than the surrounding soil, so that the tendency of water to accumulate just outside the walls will disappear; while the concrete, as it hardens with age, will present more and more resistance to percolation from below.

For keeping the dampness absorbed by the walls of the cellar from affecting the air of the house, a Portland cement coating may be perhaps the best means now available. It would have been much better, when the walls were first built, to brush the outside of them with melted coal tar; but that is probably impracticable now. If the earth stands against the walls, however, the cement coating should cover the whole inside of the wall. The situation of the building may perhaps admit of draining away the water which accumulates about it, by means of stone drains or lines of drain tile, laid up to the cellar walls, at a point below the basement floor, and carried to a convenient outfall. This would be the most desirable of all methods for drying the cellar, and should be first tried.

IN HINTS TO HOUSEHOLDERS, Ernest Turner says: An inhabited house is a sort of gigantic cupping-glass, and the heat-rar-fied atmosphere of its rooms is continually replenished from the air-stores of the soil, forced up, syphon-wise, by the excess of weight in the corresponding column of cold air outside. *Hence, to live on a poisonous soil is to breathe poisonous air.* . . . Soil, naturally wholesome, may be made poisonous by ourselves, and is very conscientious in returning the poison we have committed to its keeping. Cesspools and drains are the principal agent in this procedure.

EFFECTS OF THE PRESENT EDUCATIONAL SYSTEM.

A very valuable contribution on this subject is to be found in the Sanitary Record, by Dr. Rabagliati (M. A., Surg. to Bradford Infirmary). After referring to the difficulties in attempting to estimate the effects on health of the national system of education, he writes: It seems to me that evidence overwhelmingly conclusive exists to show that children have been over-driven by the working of the Elementary Education Act. Medical men, teachers, and parents have all testified to this, and it seems quite impossible to overlook the importance of the evidence they have advanced. As regards the medical evidence, when the names of such men as Dr. Clifford Allbutt, Dr. B. W. Richardson, Mr. Fridgin Teale, Dr. Crichton Browne, Dr. Carpenter, and others, are mentioned as having expressed themselves more or less strongly in this sense, one feels how important is the weight of opinion arrayed in support of the view. Dr. Richardson speaks of the overwork in schools as a 'temporary insanity.' Dr. Crichton Browne 'can conceive of no surer way of depriving our artisans of the next generation of their manual dexterity than to insist on sedentary habits in the boys of to-day, keeping them with books in their hands during those years when the hand centres are evolving; and speaks of its being 'high time for a declaration of rights on behalf of helpless children, and on behalf of future generations also, whom, if we are not careful, we shall load with a burden more grievous than the National debt—a burden of degeneration and disease.' Dr. Clifford Allbutt says he 'has in the course of his professional career, conversed with large numbers of medical men, but that all those with whom he has conversed have had an opinion in one way.'

After referring to cases of serious illness believed to be caused by over school

work Dr. Rabagliati continues: I could quote other cases, both in my own experience and in that of other medical men whom I could name, did the limits of this paper permit me to burden it with such details. The facts I have given refer to cases of serious illness, but there is a general concurrence of medical testimony as to the occurrence of cases of slight ailments, scarcely to be called disease, which are unhesitatingly attributed to the over-work of elementary schools. Parents, also, who are quite competent to judge in the matter, tell of sleeplessness, nervousness, startings at night, sleep-walking, pallor, loss of appetite, &c., from which the children suffer, and which the parents rightly attribute to educational over-pressure. I consider that the prevalence of one or more of these lesser symptoms among a large number of children is of more consequence to the national health than the occurrence of a few cases of severe illness, or even than a death or two. It is the widespread incidence of small illnesses or disabilities acting on a large number of children, which is likely to have a bad effect on the national health rather than the occurrence of graver ailments among a few. I have made a comparison between the mortality of children in the three years, 1868, 1869, and 1870, and that of children of the same ages in the three years 1879, 1880, 1881. The former refers to the period before the Act began to operate, and the latter to a time when it had been some years at work. He then gives a table of the Mortality of children from nervous diseases in these years and continues: If we take 535 deaths of children under fifteen years of age in the two periods and compare them, we shall find that in the three years ending 1870 forty-three of them were between five and fifteen years of age, but in the three years ending 1881 fifty were between these ages. The ratio of deaths at school ages is about one-sixth greater in the later

period than in the earlier. This result is the more remarkable when compared with the alterations of the rates of mortality among children at the same ages for the same years from diseases other than nervous. The curious fact is that whereas, as we have seen, the proportion of children from five to fifteen who die from nervous diseases has increased since the enforcement of the Education Act, in the case of deaths from 'other causes' a contrary result is found. I will not here deal with the figures in detail, but will point out the broad result. In 1868-70 for every death which occurred in children between five and fifteen years of age from other causes 52 deaths occurred under five years of age; but in the three years ending 1881, for every death between five and fifteen years of age from these causes, 62 deaths occurred under five years. That is to say, while the mortality of children between five and fifteen years of age from non-nervous diseases has *decreased* by about one-fifth as compared with that of children under five years, the mortality from nervous diseases among children of school age has proportionally *increased* by about one-sixth in the same period.—These results are remarkable, and, taken in connection with the general considerations already advanced, seem to me to justify the conclusion that the working of the Education Act is a main part of the cause of the proportional increase of mortality from nervous diseases at school age. The inference appears to be plain that sanitation is in course of reducing the mortality among young lives, but that the working of the Education Act has to some extent counteracted this

If not the Act, then some other causes must account for the increase in the mortality among children under fifteen years of age from brain diseases, and to these causes must also be due the relative increase of mortality among children of school age as compared with those under

the age of five years. In either case, the only legitimate rule we can take to guide our conduct is to pay the greatest attention that our administration of the Act be not used as a lever for raising causes of mortality, which it is on all hands agreed ought to be reduced as much as possible. At least, it is fair to ask that such modifications be made in its working as will prevent complaints that cases of short-sightedness, epilepsy, chronic meningitis, besides a crowd of smaller ailments, are directly attributed to it by medical men.

Dr. Rabagliati concludes with the following advice: It is of the utmost importance that we require of young children only such tasks as they can perform well, and that we then insist that these be thoroughly done. To set them tasks beyond their strength, or to attempt to compel attention when their limited power of attention is exhausted, can only result in inducing habits of working in a slovenly and careless manner and must inevitably tend to increase the number of men and women, already so large, who live to 'scamp' their work rather than to do their duty.

THE TYPHOID BACILLUS.

LATEST INVESTIGATIONS.

Thirteen years ago, 1871, von Rocklinghausen demonstrated certain colonies of micrococci in a case of typhoid, and thus opened the way for further enquiries, which have been actively prosecuted by many pathologists and histologists of note. In 1880, a definite form was identified by Eberth, in fatal cases found most abundantly in those most acute. This bacillus corresponded in many respects to that observed by Klebs in 1878 and 1880, in the mesenteric glands and other viscera. Koch's investigations, published a year later, tended to show that short bacilli, corresponding to those described by Eberth, were present in a very large number of cases. Corroborative obser-

vations have from time to time been recorded by Meyer, in Berlin, and by Coats and Crooke, in England, who have all found a short bacillus in the inflamed tissues in typhoid fever, in all probability, identical with that of Eberth and Koch. (Reports of the Imperial Board of Health in Germany. Vol. ii, 1884.)

Dr. Gaffky's investigations, recently made in 28 fatal cases of typhoid fever, only failed to show the bacillus in the mesenteric glands, spleen, liver, or kidneys, in two cases; in one of these, there were numerous bacilli found in the mucous membrane of the intestine, whilst, in the second, the typhoid process had fairly ceased, death taking place from accidental rupture and peritonitis.

Dr. Gaffky gives as the dimensions of these bacilli, which he apparently regards as undoubtedly specific organisms, one third the length of an ordinary red blood corpuscle, the width being about one-third of the length; the ends were rounded off, as in the case of the bacilli observed by Eberth; a few spores were visible in some of them. With regard to their distribution in the organs, he found them to be in the greatest profusion in the intestinal mucous membrane in acute cases. In the mesenteric glands they were less frequent, and in the liver and kidneys only occasionally.

In his cultivation experiments small portions of blood were removed from organs known to contain the bacilli, and, with every possible precaution to prevent contamination, placed in peptone gelatine. The resulting bacilli corresponded exactly in form and size with the original stock. A new feature, however, was present in the shape of independent movement, the smaller bacilli moving hither and thither with varying rapidity, and the longer thread-like forms showing a distinct wavy movement. The bacilli appeared to reach their most perfect development about the fourth day. Unlike some other forms of moving bacilli,

they produced no liquefaction of the gelatine.

Inoculated upon the surface of a freshly boiled potato the rapidity of development was found to be extreme; indeed, this property may be regarded as a characteristic of the typhoid bacillus. When transferred to some other cultivation fluids, the number and vigour of the newly formed bacilli were at once diminished, whilst in the potato they again recovered their number and dimensions. The formation of spores was found to take place in from three to four days at a temperature of 30 to 42 C., but more slowly at lower ranges, and not at all below 20 C. The results of experiments, with a view to induce typhoid fever in the lower animals, have been unsuccessful. Reviewing the results of his own and other observers' discoveries, he maintains that we are now justified in regarding the bacillus as the true cause of the typhoid process as an absolutely specific pathogenic organism. The history of its behaviour outside the human body, and whether its spores lie dormant or are capable of development in other media, must remain a subject for conjecture.

With respect to the exact mode of infection, Dr. Gaffky is led to a definite expression of his opinion, that whether the spores or bacilli be swallowed in drinking water or in other forms of food, or whether they be inhaled, in every case they pass the stomach unaffected, and only become developed and actively reproductive in those parts of the intestine in which are situated the solitary follicles and Peyer's patches.

THE LOUISIANA STATE BOARD OF HEALTH has been reorganized. Its membership now consists of seven physicians and two who are not physicians. The board intends to apply quarantine restrictions against all ports where contagious and infectious diseases exist, to the limit of the law, and if necessary, the total suspension of all communications with such ports while infected, will be advised.

PROVINCIAL BOARD OF HEALTH— ANNUAL MEETING.

The provincial board of health commenced their annual meeting May 30th. After the minutes of the previous meeting had been read and confirmed, the chairman, Dr. Covernton, read the annual address, which was adopted. A large number of communications were then read, amongst others one from the Postmaster General regretting his inability to confer more privileges upon the board in the sending out of mailed matter; and an order in council appointing the following gentlemen members of the Board for three years, dating from May 1st 1884:—Dr. Wm. Oldright, Toronto, Dr. Francis Rae, Oshawa, and Professor Galbraith, Toronto.

A letter was read from the secretary of the Lindsay local board of health, with a printed report from Horncastle of the outbreak of small pox in Carden township, also letters concerning the report to the Ladies Christian Temperance Union, and a letter from the clerk of Goderich, re small pox case in that town.

The matter of the monthly health bulletin was considered, and the discussion was concluded with the following motion: that the details connected with the health bulletin be referred to the publication committee and the Secretary, with power to act in the matter.

The committee on epidemics read a report concerning the recent outbreaks of small pox, after which the secretary gave additional verbal information concerning the various cases. A motion was adopted recommending that action be taken in the matter. Various other matters were then discussed: A motion was passed to the effect that the local board of health of Carden township be requested to supply the Provincial board with all the facts of the case, and that Dr. Wilson of Kirkfield be also asked to supply the board with informations.

On Saturday, various reports from standing committees were read, one being that from the committee on school hygiene, in which the Inspector of schools for halldinand, Mr. Moses, wishes the board to suggest some means of ventilating small school houses in country places especially, many of which schools have been built a number of years and no means for artificial ventilation were ever adopted. The people are about building a high school house in Dunville, and would like to have opinions from the board regarding ventilation.

The report was received and adopted and on motion, Dr. Cassidy was appointed a committee on ventilation to take charge of the matter.

The secretary thereafter read the report of the investigation into the outbreak of diphtheria at Smith's Falls, during the past winter, which was adopted.

The Secretary having introduced the question of the advisability of the board's supplying a blank book to municipalities as a sample for the guidance of Inspectors and local boards. It was decided that the publication committee be authorized to arrange for sending to each municipality a specimen blank book for reports, as is required by sanitary inspectors for reporting to local boards. The secretary was requested to prepare a circular for notifying boards, which have neglected to report the formation of a local board of health. The motion was carried.

The secretary having informed the board of the great demand there is for copies of the new Health Act, he was authorized to have 3000 copies of the "Public Health Act of 1884" printed for distribution to local boards of health. It was thereafter decided that the answers to the circular on school hygiene, and the tabulated report already made of these answers, by the secretary, be bound and preserved for future reference.

Dr. Cassidy having suggested the propriety of the board's supplying the committee on ventilation with certain instruments for its use, it was decided that the committee on ventilation be instructed to expend a sum not exceeding \$50, in procuring such instruments as may be necessary.

A motion was carried after discussion, that the board prepare a specimen specification for a system of dry removal of excreta adapted to the circumstances of small towns, and that Dr. Bryce be associated with the Committee on sewage for preparing such specification. The following members were appointed delegates to the Hamilton meeting of the Ontario Medical Association, Drs. Covernton, Yeomans and Bryce.

The question of immigrant inspection having been introduced, it was decided that the secretary communicate with the proper authorities concerning the establishment of some comprehensive system for preventing the introduction of infectious diseases by immigrants.

The report of the Finance Committee was presented, and adopted.

The members of the various standing committees for the year were appointed, which are as follows:—Epidemics, Dr. Covernton and Dr. Bryce; sewage and water supply, Dr. Oldright and Professor Galbraith; foods, drinks and adulteration, Dr. Bryce; construction and ventilation of buildings, Dr. Cassidy; poisons, Dr. Rae; school hygiene, Dr. Yeomans; legislation, Dr. Bryce; finance, Dr. Rae; publication committee, Drs. Oldright and Covernton.

This concluded the session.

SCARLET FEVER, it would appear, from some interesting facts presented by Dr. J. C. Peters, has its origin amongst houses.

FLOODS AND THEIR EFFECTS.

After the London flood last year, the editor of this JOURNAL, believing it would have a good effect upon the public health in the locality (though many were in terror of an opposite effect, and there was a great deal of anxiety and unnecessary alarm) wrote to a prominent physician in that city and predicted an improvement in the health rather than the reverse. We have not learned of any particular improvement following the wash out, or bath, but no bad effects have followed, it appears. Something may be due to the efforts to prevent any ill effects but it can hardly be doubted that the "washing" would promote the public health.

On the recent flood in Cincinnati, a recent number of the *Scientific American* has the following: For the second time it has been proved in Cincinnati that a flood, instead of being followed by sickness, prepares the way for a period of unusual healthfulness. It was so after the flood of last year, and is so now. A prominent physician says that the flood cleaned and purified that part of the city which has always been the starting place for all the diseases which have prevailed. The flooding of the lower stories of filthy buildings, the moving of household goods to other parts of the city and the moving of them back again, and the general cleansing which the flood made necessary seem to have destroyed the lurking germs of disease. In the bottoms, where there is usually more or less of diphtheria, scarlet fever, malaria, etc., at this time of year, there is now hardly a case of sickness reported. In other words, the human pig sties have been washed out. The doctors are complaining that they have nothing to do.

We will be glad if some of our London readers will endeavor to learn what were the actual effects, permanent, of the flood there, and communicate the result to this Journal.

Matters Recent and Current.

RECENT RESEARCHES ON MICRO-ORGANISMS. — The occurrence of micro-organisms in the living tissues of animal bodies has been made the subject of investigation by Dr. Hauser, of Erlangen *Par die*. By separating small slices of various organs from freshly-killed animals, and keeping them free from any possible external contamination, he found that in 72 per cent, of his cases, even after three weeks' "cultivation" in a warm and moist air, no kind of micro-organism whatever had become developed. In a few instances bacteria appeared, but these were attributed to accidental defects in the method of isolation. The influence of various gases upon the development and growth of micro-organisms was also investigated. Their influence was alike negative where no bacteria were present, but in other cases it appeared that the growth was distinctly hindered by carbonic acid gas, and as distinctly favoured by oxygen.

THE INLAND REVENUE DEPARTMENT, Ottawa, has very wisely refused to allow the importation from the United States of tea dust. An analysis shows the ingredients to be deleterious to the public health.

OPIUM-SMOKING, UNITED STATES.—Mr. Robbins, of New York, in his report for 1883, calls attention to the fact that, while the importation of crude opium for medicinal purposes has varied but little, the increase in the importation of opium manufactured for smoking purposes, has been enormous, from 106,221 lbs. in 1882, to 298,153 in 1883.

THE TENTH UNITED STATES CENSUS, Gives some interesting and instructive facts relative to the increase of insanity in that country. The total number of insane in 1870 was estimated at 37,442, as against 91,997 in 1880, an apparent increase of over 100 per cent; one insane person to every 543 of the population.

"CULTIVATED" VACCINE LYMPH, it seems is likely to take the place of "Animal vaccine." Dr. Ouest (*Cent-*

Pichi, has at length succeeded in cultivating the micrococci of vaccine, and from the culture fluid producing a normal pustule in a child in which subsequent vaccination with natural lymph from another child failed to produce any results.

THE DOMINION MUTUAL BENEFIT SOCIETY, have secured some good members in Ottawa, and we trust the number will be much enlarged. The cost of covering a life risk in it is very much less than that of stock life companies and quite as safe, we believe. Many stock companies prove failures, from bad management.

OVERCROWDING A CAUSE OF DIPHTHERIA.

—Dr. Hutton has, within three years, treated sixty four cases of diphtheria, occurring in Minnesota, and says in the *Medical Record*: These cases were all in comparatively new houses, in a belt of country where white men never had lived before, so that there was no accumulations of filth. Diphtheria had never before been there, and could not have been brought by visitors; it was of a malignant type, and some families lost five and six members each. Every house where cases were was small and greatly crowded. Many of the winter outbreaks happened when the temperature was 30o to 40o F. below zero, which would have been death to all ordinary surface germs, when the surface of the earth and all bodies of water were frozen solid. Dr. Hutton says, Diphtheria may occur sporadically, "and any small, overcrowded, ill-ventilated house may prove a diphtheria factory."

COPPER IN FOOD.—A report presented to the Paris Society of Public Medicine in 1879, supported the view that copper salts introduced into our food are harmless, and stated that there is no reason for interdicting the colouring of preserved vegetables by sulphate of copper. The Council of Public Hygiene in Paris, however, do not appear to favour this idea, since they have recently forbidden the use of these salts in the most peremptory manner possible.

WATER ANALYSIS.—In an elaborate paper on this subject, by C. E. Cassel,

F. I. C., F. C. S., Department of hygiene, University College, London, Eng., and Dr. Whitelegge, extracts of which have appeared in this Journal, the authors state that as regards the cultivation processes, which are somewhat prematurely credited with the capability of altogether supplementing present methods of analysis, it is well known that practically all waters are found to contain organisms, the commonest of which are the easiest of cultivation. It is asserted that by a cultivation process carried on in a 5 per cent. solution of previously sterilised gelatine, or other nutrient substance, the presence of sewage can be demonstrated by the differences in the naked-eye characters of the spheres which form in the matrix. But even if this be so, it merely forms an additional test for the detection of sewage—a detection which is already satisfactorily effected by other processes; and it cannot, therefore, supersede these unless it can be shown to afford a means of distinguishing between specific and comparatively harmless organisms. Whatever future success there may be in store for the cultivation processes, at present they can tell us absolutely nothing of the presence or absence of specific organisms or specific poisons of any kind.

TWO DEATHS have just occurred at Wolverhampton, with symptoms resembling those of cholera, ascribed to the effect of eating tinned salmon. The medical attendants believe that the poison which proved fatal was not a metallic, but an animal poison, the result of decomposition.

A POISONOUS FUNGUS in dried cod has recently been discovered: Distressing gastro-intestinal disturbance was set up in persons after partaking of the cod, which on section, especially near the Spine, presented a vermilion red color. M. Bertherand (*Jour. de med. et de Chir. de l'Algerie*,) suggests that the red fungi may merely indicate a toxic modification in the flesh of the cod, and not be themselves poisonous. This may be so, but it is exceedingly probable that the flesh of the fish first undergoes a distinct change fitting it to support the new life. Even assuming this, it is probable that fungi

developed on a soil already hurtful, become themselves hurtful by acquiring toxic properties not normal to them.

AN INSTITUTE OF HEREDITY, has its headquarters at Boston, with branch societies in various places. Object, race improvement. The marvelous improvement that cultivation has made in flowers, fruits, domestic animals, etc., is brought forward to prove that the human race could be vastly improved, and it is urged that it is our duty to do so.

SCARLET FEVER, it appears, is usually a much milder disease in France than in Great Britain. At the last meeting of the Harveian Society of London Dr. Dawson Nesbitt suggested that this might bear some relations to the lighter diet adopted in France. This is quite probable.

HYGIENE OF SCHOOLS.—The Philadelphia Medical Times says, "while great care has been bestowed upon the sanitary arrangement of prisons and legislative halls, the needs of the school-children (some of whom probable may have the good fortune to grow up to be criminals or politicians) for fresh air seem to have been very generally ignored or forgotten."

AT THE OTTAWA MEDICAL SOCIETY'S meeting last month, in an interesting and suggestive paper on simple continued fevers, read by Dr. H. B. Small, of Ottawa, the writer of the paper, in referring to the germ origin of fevers in general, spoke of the many points of resemblance between them. "Typhoid we have seen is closely allied with simple fever on one hand, on the other we know that malarial fever is closely associated, while typho-malarial is almost recognized as a distinct fever." In relation to this he said, "of the many theories suggested, one seems to offer a very plausible explanation for the difficulties and to be more in keeping with the knowledge of the present day. It looks upon all fevers as due to a germ—not a special germ for each fever—but one, which under the influence of certain conditions, produces, in some instances a simple

continued fever, in others a fever of a malignant type. This is not restricted to continued fevers but is applied to others as well, and to see its full force the whole range of fevers must be considered." Others at the meeting appeared to concur in the speaker's view.

CANNED FOODS.—At this season these are commonly used a good deal. *The Philadelphia Medical Times* gives the following on canned foods: One of the latest utterances, and probably by one whose opinion is most worthy of serious attention, is that of Prof. Attfield, before the London Pharmaceutical Society. During the last fifteen years he has frequently examined canned goods, and has found tin or other foreign metal, where it exists, to be present only in such small proportions as to be unworthy of serious notice. Before the proportion of tin could attain to a dangerous quantity the food would have such a metallic taste as to be rejected by any sane person. Where poisoning has occurred it has probably been due to putrefactive or other changes in the food itself, due to a defect in the can, or taking place after the can is opened. The practical lesson is to smell and taste the contents of a can when it is opened, and to reject them if they have a metallic taste or are undergoing putrefaction; and it is also recommended that the whole of the contents should at once be turned out of the can when first opened. With these precautions, canned food can be enjoyed without apprehension as to the consequences.

TUBERCULOSIS AND MILK.—Either the recent experiments made by the inoculation of various substances in connection with the germ theory of disease, are making wonderful and rapid strides in advance in medicine, or many of us are being greatly deceived, says an exchange. M. H. Martin thinks he has demonstrated by a series of inoculations of milk in guinea-pigs, that the milk ordinarily consumed in Paris is susceptible of communicating tuberculosis. Out of nine inoculations, three were positive in this result, and he advises that milk be always boiled before using. But he

considers that when taken into the alimentary canal, a lesion is necessary to admit the entrance of the morbid germ.

IN THE ADDRESS ON STATE medicine at the late meeting, in the early part of this month, of the American Medical Association, Dr. J. Deering Roberts, of Nashville, chairman of the Section on State Medicine, dwelt upon the importance of investigation into the causation of disease. In conclusion, he advocated the establishment of a National Bureau of Health, the chief of which should sit in the Cabinet, as an equal officer, to consider all questions of international hygiene and State medicine.

TRAINED NURSES.—The editor of the *Philadelphia Medical Times* writes: "If in this country we had fewer medical colleges and more nurse-training schools, the community and the profession would have cause for being sincerely grateful." It is said, too, that "nursing is rapidly assuming the form of a dignified profession. It is no longer a menial occupation, but an art and a science."

POISONOUS SLEEP PRODUCERS.—The *Lancet* enters a protest against the wholly indefensible practice of giving and taking such depressing narcotics as chloral and bromide of potassium as a remedy for sleeplessness. "Sleeplessness is always wakefulness in one or more of its multitudinous forms, and the recourse to narcotic poisons for its relief is utterly unscientific and deplorable from a therapeutical point of view. It is as clumsy in theory—in so far as it can be said to have a theory—as knocking a man down because he needs rest." It is so much easier to write a prescription or make up a bottle of medicine or a box of pills with one of the rank poisons that mimic sleep, and as they do so deprave cerebral and nerve tissue, than it would be to search out the real and active cause of wakefulness.

ON BACTERIA, evidently there is a great deal yet to be learned. Dr. Miller, of Berlin, (*Philadelphia Medical Times*) has made some experiments upon fermentation in the human mouth, and its

relation to caries in teeth. He found, in his cultures, that the microscope revealed the constant presence of a fungus, chiefly in the form of diplococci, either single or in chains, less often in form of bacteria, bacilli, or even threads. Sometimes all these forms are found on a single thread. He states that "the particular form in which the fungus occurs depends somewhat upon the culture-medium, as well as upon the age of the culture." This confirms the statement of Bastian, that the rapidity of growth affects not only the size but the form of bacteria. The experiments of Zweifel appeared to demonstrate conclusively (1) the existence in normal blood of spores; (2) the possibility, by deprivation of oxygen, of the development of these spores into bacilli; (3) the production of septic poisoning by these bacilli when injected into the peritoneal cavity of animals.

RECENT CULTURE EXPERIMENTS of Pasteur with the micrococcus of chicken cholera seem finally to establish the fact that specific virulence is an accidental or acquired property, since, by cultivation, micro-organisms can be obtained which are not noxious or infective. The question remains to be decided is, whence this power of specific infection, and what are the conditions governing its development and mode of accommodation.

INFECTIOUSNESS OF PNEUMONIA.—So long ago as 1875, Klebs asserted that pneumonia was a parasitic disease, and both he, and subsequently Eberth and Koch, had found a micro-organism in cases of pneumonia (inflammation of the lungs). That pleasing writer, Dr. Buney Yeo, F. R. C. P. &c., physician to King's College hospital, in an address at a recent branch meeting of the British Medical Association, referred to a number of severe epidemics of pneumonia, he believed the disease to be infectious, and says: I have here brought before you but a small fragment of the mass of observations which are on record, and upon which was based the view that pneumonia is an infective disease, dependent on the presence of a specific pathogenic organ-

ism in the body; and that under certain, somewhat rare circumstances of time, place, or season, it may spread by direct and indirect contagion. In all probability there are *two* forms of pneumonia—one probably arising from cold or a like cause, the other zymotic—and these two forms are at the present time confused together, just as typhus and typhoid were. That such an epidemic form exists, infections, zymotic, self-propagating, I feel in my own mind convinced."

NOVEL METHOD OF DRAINING—In Georgia a pond has just been drained into a subterranean passage 50 feet below the surface. A sort of derrick was constructed on the surface of the pond at the deepest point, to which boring apparatus was attached. Boring was carried on, and at a depth of 50 feet below the bottom of the pond the drill struck an opening, and at once the water commenced to sink with a roar through the opening. The drill pipe was drawn out and the pond commenced to employ itself as fast as the orifice that the drill had made through the rocks would permit the water to flow. A pipe will be sunk in the opening made by the drill, and the top covered with wire netting, stones &c. to keep obstructions out. The strange scene of emptying the pond was witnessed by hundreds of people, who see in it the reclamation of the millions of acres of swamp lands in the South.

AN ARTESIAN WELL had been sunk near the pond, above referred to, a little time before it was drained which yielded abundance of excellent water. Thus, within 200 feet of each other were two pipes—that of the artesian well throwing up the purest of drinking water, and that in the middle of the pond sucking stagnant water into the bowels of the earth and carrying it away.

SPAYING MILK COWS.—This operation has been, it appears, carried on in the United States for the last twenty years and is coming into extended favor elsewhere. The loss of life amongst the animals operated on appears not to exceed five or six per cent. A cow spayed when giving ten-and-a-half quarts of milk a day,

after nineteen months of constant milking, nine-and-a-half daily, and is still in full milk. The yield continues at or near this rate year after year, if the cow remain in good health, and be properly fed and attended to. If overfed, the quantity of milk will lessen, and she will be apt, to fatten rapidly, and to develop flesh which is pronounced to be more tender and juicy than ox beef. Cows thus treated have continued to yield milk, without intermission, for more than eleven years. The milk itself is stated to be rather improved in quality than otherwise, as regards its adaptation to digestion by the human stomach; the percentage of sugar and of fat are increased, and that of the casein slightly diminished, while its keeping quality is maintained at a uniform standard.

A PLUMBING SCHOOL has been established in Philadelphia.—A representative of *The Sanitary News* visited the school and found fifty pupils enrolled. The instruction going on was in wiping joints—vertical, horizontal and branch,—and in wiping seams. Those interested in drawing were sketching faucets and other sanitary appliances. The practical results cannot but be beneficial.

THE MICHIGAN STATE BOARD OF HEALTH at its regularly quarterly meeting last month passed the following resolution: that this board "respectfully and earnestly memorializes congress to pass the bill, introduced into the House of Representatives, Jan. 8, 1884, by the Hon. Casey Young, or of some similar bill, providing for the prevention of the introduction of infectious diseases into the United States, and for procuring information relating to climatic and other conditions affecting the public health."

A COMMUNICATION from Dr. Domingos Freire, Prof. Fac. Med, &c of Rio Janeiro, in the *Sanitary News*, gives an account of some apparently successful experiments in vaccination for the prevention of yellow fever. Further developments will be awaited with interest.

SEVERAL medical institutions have sent memorials to the U. S. Congress praying that a reward of \$10,000 be offered for the discovery of the yellow

fever germ and a preventive or a cure for the disease.

SOME INVESTIGATIONS by Dr. Grassi, of Rovellasca, show that common flies may carry contagion. They carried exposed ova of human parasites to different parts of his house. The ova were found in the dejecta of the flies.

Individual Hygiene.

DIET—MASTICATION.

In selecting his food, it is said, and truly, that man is choosing his mental and moral, as well as his physical character. Of all subjects of hygiene, taking it altogether, that of diet is probably the most important. Perhaps no part of the subject of diet requires more attention than that of the process of mastication. Thorough mastication and insalivation getting the food well mingled with saliva and air, is indispensable to good digestion. With the habit of thoroughly grinding the food, that of eating slowly is secured, and hence the natural feeling of satisfaction when enough has been eaten is more readily observed and over eating is avoided. And there are but few who do not injure themselves by over eating. It is only what is digested and assimilated that nourishes the body, whatever is eaten more than this is harmful. Imperfect mastication is then responsible for a good deal of trouble. Imperfect digestion imperfect and impure blood, and general derangement of the entire organism, with mental irritability.

PREVENTION OF SUMMER COMPLAINT. —

Dr. David Little, of Rochester, N. Y., had been physician to a children's orphan asylum for twenty-two years, and every summer there had been enteric disease. In the summer of 1882 he ordered that the infants be fed only every three or four hours, and that water be given if the child cried in the interval. There was not a single case of enteric disease in the institution during that season.

OLD AGE MAY BE RETARDED, it is said, by moderation in eating, avoiding food rich in the earthy salts, and drinking distilled water. It is well known that

advancing age is characterized by an increasing per cent. of earthy matter in the tissues. The quantity and selection of the food may exercise an influence over this accumulation of earthy salts. It is supposed that the powerful solvent properties of distilled water will prevent these accumulations and tend to remove them when already formed. It may be drunk *ad libitum*. Its solvent power increased by the addition of a few drops of dilute phosphoric acid to each tumblerful. As the *Medical World* says, "this procedure seems quite as clearly indicated in advancing age, as the giving of phosphate of lime and medicines and foods rich in this salt to rickety children."

THE MOST PERFECT REST to all parts of the organism is obtained when the body is in the recumbent posture—lying down flat, on a level surface. In this position the heart beats slower than in any other, and the breathing is calmer, so that the organs of the circulation, and the chest and lungs, are taxed in the least possible degree, while all the voluntary muscles are entirely inactive. The more perfect the repose and the lower the degree of excitement, the more complete will be the renovation of the tissues, and the greater the after ability to endure labor. The wild Indian, the Tartar messenger, and the wandering Arab, yielding to a sort of instinct, when weary, stretch themselves prone upon the ground or upon mats or cushions; and they rise again wonderfully refreshed and ready for more of their wonderful pedestrian feats. We might take a valuable hygienic lesson from these creatures of nature. So when you are tired, instead of taking some stimulating drink, as too many do, or sitting in a stiff, straight-backed chair, lie down or recline as much as you possibly can.

We regret that we have not yet been able to get the cuts, as we expected, for illustrations in the "hints on the methods of developing the chest and lungs" prepared for this number.

GENTLEMEN

About to purchase Spring Clothing should Inspect our Magnificent Stock of New Spring Suitings, Trouserings, and Overcoatings, which we are making up in that very superior manner for which our House is celebrated. Scotch Tweed Suits from Eighteen to Twenty-Eight Dollars. Fine Worsted Suits from Twenty-two to Forty-Five Dollars.

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We have pleasure in presenting, for the consideration of the Medical Profession, "BEEF PEPTONIDS." We consider this product the most valuable that ever emanated from our Laboratory, and we feel confident it will be welcomed by the Profession in all parts of the world.

BEEF PEPTONIDS contains *only* the *nutritious portions* of the beef. It contains *no water* and *no inert matter* of any kind. We combine the dry Extract of Beef with an equal *portion* of Gluten to prevent a tendency to deliquesce, and in order to present the preparation in a powdered and portable form. It is well known that Gluten is the most nutritious substance found in the Vegetable Kingdom, and in nutritive elements is closely allied to Beef.

Four ounces of BEEF PEPTONIDS represent as much nutritive and stimulating properties as forty-eight ounces of the best lean Beef.

Four ounces of BEEF PEPTONIDS contain more nutritive elements than ten pounds of any extract made by Liebig's formula, and from four to six times more Albuminoids and Fibrinoids than any Beef Extract ever offered to the Medical Profession.

Our machinery and process for the production of BEEF PEPTONIDS are perfectly adapted to the *elimination* of all inert portions of the Beef, and the *retention* of all the nutritive constituents.

BEEF PEPTONIDS is *much less expensive* than any other preparation in the market, as it contains *neither water nor inert matter*.

The favour our preparation of BEEF PEPTONIDS received at the hands of Drs. AGNEW, HAMILTON, BLISS, REYBURN, WOODWARD, BARNES, etc., the corps of eminent physicians who employed the preparation with so much advantage in the treatment of the late PRESIDENT GARFIELD proves conclusively its great value as a food.

Great care is exercised in selecting the Beeves, and none except the most healthy and suitable are employed in making our BEEF PEPTONIDS.

DIRECTIONS FOR USE.

FOR AN ADULT.—*From a teaspoonful to a desert-spoonful, added to a cupful of boiling water, and salt to the taste. Children in proportion.*

It may be given as often as required, say three to six times a day. If preferred, it may be added to soups or other liquid food. In the event of the patient's stomach being in a weak condition a larger quantity of water should be added to the BEEF PEPTONIDS, and administered in teaspoonful doses.

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Very respectfully,

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H. P. Gisborne, 10 Colborne Street, Toronto.

Seasonable Hints.

GREAT CARE IS REQUIRED at this season, especially those not accustomed to active physical exercise, in order to avoid getting over heated, and giving rise to what is called sunstroke. Take things quietly during the hot days, and avoid the sun's rays.

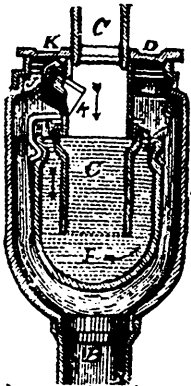
WHEN MUCH HEATED remember it is dangerous to go into cold water; though the head may be freely bathed with it.

A "COLD" is very readily taken when one much heated sits down in the cool of the evening with very little clothing on, especially one not having a very vigorous healthy skin, or who is susceptible to colds. A coat or shawl should be put on as soon as one fairly begins to cool off.

THE TURKISH BATH, after the thick clothing and full diet of the cold weather, is an excellent preventive of the diseases of summer; fortifying and promoting the activity of the skin and relieving the digestive and other nutrient and excretory organs.

Miscellaneous.

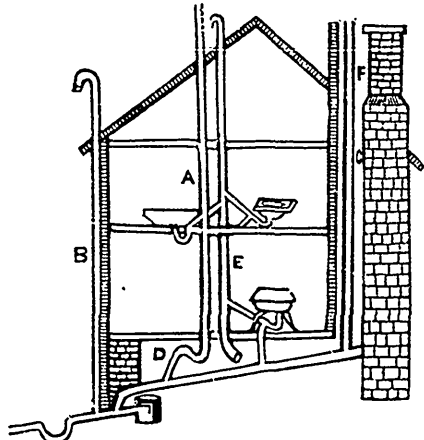
IMPROVED SEWER PIPE TRAP.—the invention of Mr. Pietsch, of L. I. The construction and operation are the same as the ordinary trap, except



that in the pipe above the water seal there is a light valve, J, in the above figure. The sewage pipe, C, dips within cup F; and the overflow rises over the upper edge of the same and escapes into box, A, and off through B. The extremity of C is always kept sealed by the liquid within cup, C. In the ordinary trap, when there is a downward suction in B, it is apt to draw out the water seal in F, and when this seal is gone there is nothing to stop the back flow or rise of the sewer gas into the room or

house. But in the present improvement, when any down suction takes place in B, it causes the valve, J, above the seal to open, thus drawing off the gas without disturbing the water seal in F, and any rise or back pressure of gas closes valve, J, and is resisted by the water seal in cup, F. The *Scientific American* says, We believe this is almost the only trap which carries with it an effectual means for preventing the siphonage of the water seal.

A PLAN FOR VENTILATING house drains together with the air-space between the house and ground, by Mr. D. Whiteford, is given in the *Sanitary News*. He writes, my arrangement is first to have



the ordinary openings through the side walls shielded by a suitable grating for the free admission of fresh air. Then I construct a brick flue, F F, in connection with the kitchen chimney, the lower end of which is made to open into the space beneath the floor, and the upper end to be level with the chimney top. This flue may be built of any size desired, though a foot square will generally be found sufficient, and the partition wall between it and the smoke-flue should not be thicker than the simple thickness of a brick. The result is that the heat of the chimney rarifies the air in the flue and a continuous circulation is produced. The combination of this with the ventilation of waste-pipes and soil-pipes is obvious from the above plan.

QUASSIA WATER (2 oz. of quassia chips boiled in 1 gal. of water) is an excellent protection against insects: mosquitoes, flies, and such like insects will not bite, it is said, when the skin has been washed with this solution. A writer in *Nature* used it in the vinery for the green fly, and says "one washing dismissed them in a day." It is found useful for many garden plants.

DEATHS FROM CANCER, in New York City, according to the *Popular Science Monthly*, have more than doubled in the last fourteen years

A PROJECT is on foot, in London, for the offering of a prize, or prizes, under the auspices of a committee of prominent personages, for a cheap and palatable non-intoxicating beverage.

TWENTY PER CENT of funeral receipts are offered by London undertakers to physicians who secure them an order. Imitating the retail druggists.

AN ATTEMPT is to be made, on a large scale, to drain and replant the Roman Campagna.

ACCORDING to statistical returns, there are no less than 2,432 female physicians in the United States.

BALTIMORE has an Inspector of Plumbing, an office which should be created in every city.

ADDISON, it is said, was one of the ablest of medical teachers, and yet he was born of insane blood and died by his own hand.

IT IS BELIEVED by Dr. Robertson, Prof. of diseases of horses, Royal Veterinary Col. of London, that scarlet fever is generated spontaneously among horses. Dr. C. Peters, of New York, while not willing to accept this, states his decided belief that horses have scarlet fever, and that they give it to men and receive it from them.

IT CANNOT be a matter of indifference what a man eats and drinks. He is in fact choosing his animal and moral character when he selects his food.

A SINGULAR ACCIDENT happened lately at a mill in Nashville, Tenn. A workman was thrown towards a circular saw, and, thinking he would strike it, died of fright. When picked up, he was dead, but there was no sign of a bruise on his body.

No Norwegian girl is allowed to have a beau until she can bake bread and knit stockings, and it would do your heart good to taste the bread and wear the stockings that 15 year old Norwegian girls can make.

THERE ARE, it is said, 140,000 homes in France without a window, with no flooring but the soil, and where families and brute beasts are herded together in common.

A MRS. BAKER, of Taylorsville, Va., is said to be 99 years of age, and attributes her longevity to her use of strong coffee, of which she drinks a dozen cups daily.

THE POPULAR BEVERAGE of the future is said to be milk, charged with carbonic acid gas, and bottled in the usual way. It is claimed that milk thus carbonated will keep for an indefinite period.

BLINDNESS HAS STEADILY DECREASED in England for the last thirty years, owing, it is believed, to the improvement of opticians, and the almost complete extinction of small pox amongst children.

THE GREAT INTEREST manifested in the International Health Exhibition is shown by the fact that application has been made, by British exhibitors alone, for space five times as great as that actually at the disposal of the executive council.

THE SANITARY AUTHORITIES of Rio Janeiro are now empowered to inflict a fine of \$30, and an additional fine of \$3 on the owners and tenants of overcrowded courts, lodgings, &c., for each person over the proper number. The places may be closed up until repaired. The building department will not allow courts or small houses within certain limits. More important cities may take a lesson.

DR. POULAIN believes that the reason that cow's milk so often disagrees with children is in the fact that cane sugar is used to sweeten it. He says that for thirty-three years he has used the sugar of milk with the best results.

Questions and Answers.

Space will be given in each number of this JOURNAL for questions and answers on all subjects pertaining to health.

Any such questions, if not answered by others, will be answered by the editor, as satisfactory as possible.

HERON wants to know what we think about wearing flannel next the skin in Summer. We give our own practice. In warm weather wear thin under garments of woollen and cotton mixed; in very warm weather, only cotton, no under wear; when a cool day comes we put on the latter. Never wear flannel at night.

W. B.—Coal ashes sifted answer every purpose for which dry earth has been used in earth closets. Ash closets are very common in England.

Publisher's Notices.

AN ENTIRE CHANGE in the mechanical part of the Journal—change of printers—has caused grievous delay in this and the May number, which we hope to avoid in future.

MANY OF OUR SUBSCRIBERS are in arrears for volume six. Dunning is always unpleasant, but we would be very glad if more of those receiving the JOURNAL would not so far forget or neglect their little obligations to it. It is a small matter to each, but remember, in the aggregate, not small to the publisher.

ALL WOULD DO WELL to look over the advertisements in this number, none but reliable ones are inserted—observe and remember Putley's in regard to Gentlemen's Spring & Summer Clothing.

Literary and Scientific.

IS LIFE WORTH LIVING?

Mignet the historian and sage was once asked, 'do you think that life is worth living?' He must have been then not less than eighty-three years old and had had an unusually wide experience of life. His answer was as follows: 'I was not born to fortune, and have never been rich. Yet, if I had the option of taking a fresh start in life on the conditions under which I set out I should not hesitate to accept the offer. I feel like a person who has witnessed a great drama which is drawing to its close, and who has done his best to understand it. I have not had a box-ticket of my own, but I was able to enter the best boxes, which between the acts is an advantage. Human existence is full of interest to me still. It greatly depends upon ourselves whether we go through it in a matter to be satisfied with or otherwise. The German pessimist say, the mistake of nature lies in a universal effort to arrive at consciousness. I don't see the harm of that state. The mischief lies in trying to remain in the nursery of sensation when we should be putting away childish things. If I had to choose the conditions under which I was to begin life again, I should say, with a sound mind in a healthy state, in a temperate climate, and in an intelligent family that was not rich. Absolute poverty is bad. But scanty means are more conducive to happiness in youth than wealth. They help precisely to force us out of the nursery. I have spoken of, and to make us go to school where out best faculties are brought to play. There is constant degeneration in very rich and royal families—or, indeed, in all families who eat and drink too much and have more than their share of material enjoyment.

RETREAT OF MATERIALISM.—In a recent number of "The Week" we find this: "It has been recently remarked that 'Materialism is now in full retreat,' that the aggressive position taken up by it of late years, and the strength it has given to the opponents of Christianity in formulating assaults upon the beliefs and faiths of the past, are weakening, and correspondingly, that theistic literature is taking heart of grace and coming more boldly to the front. No more encouraging evidence of this fact is to be seen than in the publication of such books as Paul Janet's 'Final Causes,' Prof. Flint's treatises on 'Theism,' and Mr. Henry Drummond's 'Natural Law in the Spiritual World.' The latter work met with remarkable favour, seven editions being successively called for by those who desire to see the tables turned on agnostic science."

IN THE CENTURY MAGAZINE for July, John Vance Cheney gives this:

FATE.

A sunbeam kissed a river-ripple,—
"Nay,
Naught shall dis sever thee and me!"
In night's wide darkness passed the beam away.
The ripple mingled with the sea.

IN ST. NICHOLAS for July, Mary Lamb contributes the following:

A GOOD DRUGGIST.

A MAN who kept a store
Once wrote upon his door:

"Oh, I can make a pill
That shall ease ev'ry ill!
I keep here a plaster,
To prevent disaster;
Also some good ointment,
"To soothe dis-appointment."

When customers applied,
These words are what he cried:

"Now, *Patience* is the pill
That eases ev'ry ill;
Take-care is a plaster,
Which prevents disaster;
Good-humor an ointment,
Soothing-disappointment."

SPEED OF ICE BOATS.—With a twenty mile per hour breeze ice boats have run, on fine ice, at the rate of 70 miles an hour. If you squeeze a suitable wedge between thumb and finger, you will find the wedge to move further and faster during the squeeze than the fingers that impart the movement. On the same principle the ice boat, which is the wedge, may be driven three times or more faster than the propelling wind, when the latter acts against the inclined side or sail of the boat.

FOR CORRECTING the rancidity of butter. The rancidity is due to butyric acid, a substance freely soluble in water or fresh milk. The butter should be thoroughly washed, first with good new milk and then with cold spring water; or the butter can be melted in water, which will dissolve out the butyric acid, and then worked over.

EXPERIMENTS made with gases upon insects proved the Colorado beetle hardest of all. It took prussic acid vapor to kill it outright, and was paralysed in illuminating gas.

RIGHT HABIT is like the thread on which we string precious pearls—the thread is, perhaps, of no great value, but if it be broken the pearls are lost.

HAINES BROTHERS OF NEW YORK

CELEBRATED SQUARE AND UPRIGHT PIANO FORTES.

*Are now used by the very best Artists and Musicians throughout the United States and Canada,
among the many testimonials received we select a few as follows :*

HER MAJESTY'S OPERA COMPANY.

COL. J. H. MAPLESON, *Director.*

To the Messrs. HAINES.

NEW YORK, April 1st, 1880.

Gentlemen.—Having had an opportunity of using your “*New Concert Upright Pianoforte*,” at the Concerts given by *Her Majesty's Opera Company*, at the Madison Square Theatre, we beg to compliment you upon your great success. Your *New Upright* surpassed our expectations. You can justly claim a superiority over any Pianoforte we have hitherto seen for Concert purposes which is equally as well adapted for accompanying the voice. Wishing you a continuance of the great success already achieved, as manufacturers of the *first rank*,

We remain, very truly yours,

ITALO CAMPANINI, MARIE MARIMON, ANNA DEBELOCCA,
ANTONIO F. GALASSI, SIGNOR BISACCIA, EMILE AMBRE.

Dear Messrs. Haines :

BOSTON, November 2nd, 1882.

The Pianoforte of your make used at my concert, last night, is the most admirable instrument I have ever seen. I was especially pleased with its marvellous sustaining and carrying quality, as well as with the delicacy and evenness of its action, which I was afforded a complete opportunity of testing in accompanying myself during the concert. Very-sincerely yours,

CHRISTINE NILSSON.

VICTORIA HOTEL, 27th St. and 5th Avenue, New York, May 4th, 1882

Dear Messrs. Haines,

I beg to acknowledge receipt of the invoice of the magnificent Upright of your make that I selected, and herewith enclose shipping directions. Neither in Europe nor America have I seen an Upright that equalled yours in pure singing quality and great volume of tone or elasticity and evenness of action. It will have constant use in the salon of my villa at Bologna, and will be a daily reminder of the delightful associations I have found in America. Hoping to have the pleasure of a visit from you at Bologna, and with thanks for your many kindnesses, believe me, with much respect, sincerely your friend.

ETELKA GERSTER GARDINI.

To Messrs. Haines,

We have used your “*New Concert Upright*” on our recent tours, and the peculiarly successful manner in which it stood the severest tests, *such as have heretofore been applied to the Grand Piano only*, commands our unqualified endorsement. Appreciating your great success as manufacturers of the *First Rank*,

We remain, very truly,

PIETRO FERRANTI, MAURICE STRAKOSCH, EMMA C. THURSBY,
A. TORRIANI, JOSEPHINE CHATTERTON—BOHRER,
P. BRIGNOLI, JULIA CHRISTIN, ALFRED H. PEASE.

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