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THE PRINCIPLES AND PRACTICE OF
HOUSE-DRAINAGE TRAPS.

BY GEORGE E. WARING, JR., SANITARY
ENGINEER.—FROM THE CENTURY FOR
DECEMBER.—Continued.

THE WATER-SEAL AND OTHER TRAPS, constituting one of the most essential elements of plumbing work, have for some time past occupied the careful attention of all who are interested in the improvement of house drainage. Few who have applied their ingenuity to the subject have failed to invent and patent a "sewer-gas" trap. I took out a patent for a trap of this sort myself some years ago,—probably one of the least successful of the whole list. The best of the efforts of others, thus far, have been only measurably successful. I am still using one or two of them in my own work, because they are passably good, and because nothing else has offered that seemed better. The successful accomplishment of the object in view offers probably the most hopeful field to which sanitary inventors can now turn their attention. Devices intended to meet existing difficulties have not all been confined to the form and construction of the trap itself. Much the most widely recommended and successfully enforced effort to meet the difficulty has been to supply what is known as the "back ventilation" of traps. Having known of the early failure of this device, before it was generally recommended to the public and taken up in the compulsory regulations of health

boards, I have never been able to look upon it with favor. There is no doubt that under many circumstances it does good, but I believe that *on the whole* it does more harm.

Not only as confirming my own view, but as an illustration of very thorough and careful experimental work, attention may properly be called to an investigation carried on for the City Board of Health of Boston, by J. Pickering Putnam, Esq., an architect of that city. These investigations have been set forth quite fully in illustrated communications to the "American Architect," which papers certainly mark a very important step forward in sanitary literature. The deductions to be drawn from these investigations are these:

While a sufficient vent hole at the crown of a trap will prevent its contents from being withdrawn by siphonage (suction), insufficiency in such an opening, resulting from whatever cause, defeats the purpose for which it was made. Insufficiency may be due to several things. (a) The opening may originally be made too small. (b) It may, and very often does, become reduced in size, or entirely closed by the accumulation of foul matter thrown into it during the use of the trap. (c) As its efficiency is due entirely to the admission of air fast enough to supply the demand for air to fill the vacuum caused by water flowing through some portion of the pipe beyond the trap, it is not only a question of having an adequate current led freely to

the opening. As the opening is into a portion of the drainage system that is unprotected by a trap, it cannot, of course, communicate with the interior atmosphere of the house; it must be connected by a pipe either with the open air outside of the house, or with the air of the upper part of the soil pipe, above all fixtures. The ability of this pipe to transmit air in the volume required depends on its size and on its directness. A one inch pipe, one foot long, for example, may admit air fast enough, while a longer pipe of the same diameter, or a smaller pipe of the same length, would not do so. One or other of the defects above indicated may very easily defeat the object, and, in so far as the opening may be decreased by the accumulation of waste matters, the object, which is fully secured while the work is new, may be permanently defeated by a condition that occurs after a little use. What seemed originally to be adequate security may become untrustworthy in time.

Then, again, the trap to which such back ventilation is applied depends for its efficiency on the permanence of its water-seal. A water-seal which has no other exposure to the air than it gets under ordinary circumstances, will not be so reduced by evaporation as to lose its value for a considerable period; but with back ventilation, a current of air is established through the pipe in the immediate vicinity of the trap, and evaporation becomes more rapid, destroying the seal by removing the water in a very short time. It was an unsealing due to evaporation that first caused me to discard the method. I believe, most firmly, that when the system of back ventilation, as now practised, is applied to all the traps of a house, the destruction of the seal by evaporation will be much more to be feared than it would be in the same set of traps by siphonage only if not vented.

Traps are also frequently emptied of their water by capillary attraction. When a rag, a bit of string, a matting of hair, or any other porous substance having one end immersed in the trap, has the other end extending over the bend and leading into the discharge pipe, traps having a seal of only the ordinary depth may be emptied in a short time by this action alone. In other cases, and even where

the traps are considerably deeper, the capillary material, by increasing the evaporating surface, greatly increases the liability to evaporation in the presence of the current of air produced by the venting-pipe. While, therefore, this capillary action is not an infrequent source of the failure of a trap which is not ventilated, it is also an aid to the destruction of the seal when it is ventilated.

Mr. Putnam's experiments were conducted in logical order. He first demonstrated that the air rushing through the trap to supply a vacuum caused by a flow in the piping beyond carries the water with it as a matter of course. Some of this water, striking against the walls of the trap, is thrown back to its original position, so that the whole volume of sealing-water is rarely removed with a single motion, whatever the form of the trap. However, he found that, sooner or later, under a sufficiently continued movement of air, the whole of the water, even in a deep trap, might be so withdrawn as to break the seal permanently. The time required for this depends very much upon the number of surfaces of the wall of the trap tending to throw the water back into it. It was found that, of the common traps, the ordinary "pot" or "bottle" trap offered the greatest obstacle to siphonage. It was assumed that "the severest test for siphonage to which a trap could possibly be subjected in practice would be that which would be sufficient to siphon out an eight inch pot-trap or a ventilated S trap constructed in the usual manner." The apparatus used was strong enough to destroy in one second the seal of a one and one-quarter inch S trap, having a one and one-quarter inch vent-opening at the crown, having a one and one-quarter inch smooth lead pipe, sixteen feet long, connected with it, and to siphon out an unventilated pot-trap eight inches in diameter, having a seal four inches deep. It was shown by this apparatus that a reduction of diameter of the vent-pipe, or an increase of its length, lessened the stability of the trap. The experiments demonstrated that none of the ordinary traps can withstand a not unusual siphonic action, even with what would be considered adequate ventilation. These experiments were repeated in a great variety of ways with the same general result.

[Mr. Waring then explains some experiments showing the results of capillary action in unsealing traps, and continues.]

From this we see that ventilation greatly increases the danger arising from capillary attraction, often rendering the latter dangerous in cases where, without ventilation, the seal would not have been broken."

PUTNAM'S TRAP. — As an incidental result of his experiments on siphonage, Mr. Putnam, by gradual stages, arrived at the invention of a trap which seems to be a practical one, and which, subjected to tests that were sufficient to break the seal of any ordinary trap even with fair back ventilation, maintained its seal undisturbed. The theory followed is this: Siphonage is due to the rapid movement through the trap of air driven in by atmospheric pressure, to fill the partial vacuum formed by the withdrawal of air from the pipe beyond the trap by the inductive effect of flowing water; the first tendency of the current thus produced is to carry the sealing-water with it. In a perfectly smooth curved trap the removal of the water may be complete and almost instantaneous; in traps of irregular form, where the water in its course strikes against the wall of the trap, it is thrown back or deflected from its course; when so thrown back a portion of the water is still carried on by the current of air, but another portion falls away from the current and resumes its position in the trap. If a sufficient number of deflecting surfaces are presented in the course of the current of air, the whole of the water, after a certain portion of the seal has been removed, is retained, and the complete unsealing of the trap cannot occur.

Mr. Putnam's trap, the form of which is illustrated herewith, stands, in its normal condition, entirely full of water. Under strong siphonic action about one half of this water follows the air toward the drain; this amount being removed, the deflecting surfaces of that portion of the apparatus thus emptied suffice to rob the air-current of its spray, and under no test that has yet been applied, with an open-topped soil pipe, can the seal be broken. The interior of the trap is well exposed to view, and the arrangement for cleaning in case of need is simple. The trouble of an occasional unscrewing of the glass cap to remove an obstruction

would be a very small price to pay for the absolute security which Mr. Putnam seems to have achieved.

Since the above was written, I have tested Mr. Putnam's trap, finding it effective, in withstanding syphonage, and substantially self-cleansing. It seems to me the best trap that I have seen.

This trap or something like it may probably come into universal use for wash-stands, baths, and laundry-tubs,—for urinals, also, where separate urinals are used. For water-closets, it cannot take the place of the exposed trap of which the bowl constitutes one arm.

ON THE PREVENTION OF CONSUMPTION.

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The prevention of pulmonary consumption may be regarded from three principal points of view. First, the prevention of the transmission of the phthisical disposition, or tendency, from parent to offspring. Second, the prevention of the disease when the predisposition exists; and third, the prevention of those unhealthy conditions and circumstances of life which are known to favour the acquirement of phthisis.

(1) The hereditariness of phthisis has been placed beyond a doubt, but from the point of view of prophylaxis it is important to remember, that by the hereditary nature of phthisis, we do not mean that phthisical parents convey to their offspring a constitution which must necessarily, at a given period of life, develop tuberculous disease, but rather that they transmit to their children an organisation which renders them more prone than others to be attacked by phthisis.

Difficult and delicate as the task may often be, it is undoubtedly the duty of the physician, and especially of the confidential medical adviser of families, to give timely warning of the danger and distress which are almost certain to follow in the train of marriages between persons who present well marked hereditary tendencies to tuberculous disease. It will, we believe, be generally found that the public are more disposed than they formerly were to give a thoughtful attention to such warnings. The gradual

spread of sanitary science, and the diffusion of a knowledge of the laws of health throughout society, and the existence of more intelligent and more truthful views of the nature of disease will account for this.

We should, then, on all suitable occasions insist on the perils that attend the union of couples when on either side, and more especially when on both sides, there exists an inherited predisposition to phthisis.

But, as we have already said, there are unmistakable signs that the educated classes are becoming more and more alive to these dangers, and we hear now, much more frequently than we used to formerly, of objections to marriages wholly and rightly on account of hygienic considerations.

It is false sentiment, and a mistaken kindness to allow young people, ignorant of the consequences of their act, and inexperienced in all the cares and struggles of life, to enter upon a matrimonial union when the physical condition and prospects of the contracting parties are unsatisfactory.

The prospect of the anxiety, anguish, and misery attendant on constant illness and delicacy, and premature death, should outweigh all sentimental considerations.

(2) We have next to consider the best means of preventing the development of phthisis in those persons in whom a tendency to that malady is known to exist.

An infant born with an hereditary tendency to phthisis will require the most careful management. On no account should a mother with phthisical tendencies be allowed to suckle her offspring. There is danger in this to both mother and child. There is danger of injury to the nutrition of the mother by the tax which lactation imposes on a feeble organisation and there is danger to the infant that the mammary secretions, in such cases, may be vitiated and imperfect.

For such infants a vigorous and healthy wet nurse should be selected, and if possible it should be brought up in the free, open air of the country, rather than in the confined atmosphere of crowded cities. Frequent exposure, carefully protected, however, from chill or from too rigorous weather, to pure air and sunshine, and residence in well ventilated,

but sufficiently warm, apartments by day are of much importance to such infants. Their chest and limbs should not be cramped by any tightly fitting garments, but allowed perfect freedom of movement. The nurse should be particularly cautioned against allowing awkward attitudes which tend to compress the chest and to hinder its free expansion. The reclining position is best for the weakly infant, so that the weight of the head and shoulders is not thrown on the front of the chest or on the spine, as is sometimes the case when the child is carried much in the nurse's arms.

Attempts should early be made to ward off that morbid sensitiveness and vulnerability of the cutaneous surface so common in those predisposed to phthisis, and which is, in a measure, the index of, and provocative to, bronchial sensitiveness and irritability; and without making any rash and risky attempts at hardening such as some have advised, and which, when they do no harm, probably do much good, we may yet even in the early months of infant life adopt mildly bracing measures, which may afterwards give place to a more vigorous hardening system.

For this purpose it is a good plan, after the child's morning bath, to sponge over the surface of the body rapidly with cold sea water, or water containing sea salt, to which a tablespoonful or two of spirits of wine, or Eau de Cologne have been added. The infant should, of course, be quickly dried, and it will usually be found that this process has a bracing and invigorating effect, especially stimulating to the functions of respiration.

It should be remembered in this connection, that a certain amount of crying is not injurious to an infant, but is often a useful gymnastic exercise to the respiratory organs, leading to a more complete ventilation and expansion of the lungs than ordinary breathing ensures.

When it is impracticable to obtain a wet nurse, the child should be given perfectly fresh cow's milk, boiled, slightly diluted with water, and to which a little sugar of milk may be added. At the period of teething, a little beef tea may be added to the milk, and if dentition be tardy or difficult, some preparation of lime is useful.

More than ordinary care is needed in watching these children through the common ailments of childhood, and, especially in measles and whooping cough as well as in scarlet fever. Measles and whooping cough are especially dangerous to such children, for the catarrhal and congestive attacks of the respiratory organs, which so constantly accompany these affections, are prone to linger and degenerate into, or predispose to, incurable pulmonary mischief.

After weaning, which should not be too long delayed, milk should still form the chief part of the child's food, and the digestion of the food should be carefully watched. Any tendency which may manifest itself to acidity, flatulence, vomiting, or diarrhoea should lead to a careful revision of the diet. By degrees, a small amount of animal food, which, until the child has thoroughly learnt to masticate, should always be reduced to a finely divided or pulpy condition, may be introduced. All excess of saccharine substances, should be avoided as tending to set up acid fermentations.

As soon as the child begins to take bread stuffs, it is highly advisable not to use the over refined wheaten bread, but the *decorticated whole wheat meal bread* is much more suited to the nutrient needs of the growing child.

With respect to the administration of stimulants to such young and delicate children, much difference of opinion exists. It is desirable to have no prejudices or predilections on this head. There are many, probably the majority of such children, who positively dislike all stimulating drinks, and resist taking them, I would not press them upon these, but there other, feeble, lymphatic, pale children, to whom a small quantity of wine or sound beer seems to serve as a remarkable aid to nutrition; and we must be cautious how we allow any theoretical or sentimental objections to alcoholic stimulants of all kinds to interfere with the chief duty which here lies before us, viz: to maintain nutritive activity whenever it shows any tendency to be lowered. I consider a small quantity of good sound beer more useful than wine, but of wines I prefer a little sound Burgundy with water, or one or other of the well selected Hungarian wines. It is only in very exceptional cases that so strong a wine as

port is advisable. In these cases, the wine must be regarded as a medicine as well as a food. Hoff's malt extract may serve as a substitute for beer.

As the child advances in years, when it has reached 5 or 6 years of age, judicious and careful attempts to brace and harden the constitution should be systematically prosecuted.

For this purpose, free exercise in the open air, wisely devised gymnastic exercises, together with the use of cold sponging, cold affusion, or cold douches should be daily employed.

The gymnastic exercises should have for their object the complete development and expansion of the chest so as to lead to the thorough inflation and ventilation of all parts of the lung, the strengthening of the respiratory muscles and the development of the muscular system generally, and the correction thereby of faulty attitudes and positions. But these exercises must not be carried to the length of causing fatigue or exciting any feverish reaction. It should always be borne in mind that their object is to promote healthy nutrition; if they excite or fatigue, they must be modified or discontinued. We have already alluded to the value of cold affusion in lessening that sensitiveness of the surface, which proves often so serious a trouble in after life, while as a direct stimulant of the respiratory function it is also of great value. It is needless to insist that cold affusion and cold douches must be applied with great care and caution to delicate children. The process of accustoming them to this treatment must be a gentle and gradual one, and it must be particularly noted whether they react well to this stimulant or not; if it should cause chilliness or languor and drowsiness, it had better be discontinued.

The warm weather of summer is, of course, the best season for initiating this treatment, and when once it is established it may be continued throughout the year, but, in the cold season it should always be applied in a *warm* apartment.

It is also necessary to watch the education and school life of such children closely. Close application to study in crowded school rooms, must be positively forbidden; overtaxing the mental powers must be carefully provided against; sharing in athletic games which, while

they tend to injuriously excite the circulation, expose also to the danger of chill after such excitement, must be strictly excluded; and all faulty attitudes and positions during school studies should be corrected.

Especially ought the health of young women to be carefully looked to at this period, for in their case, besides the dangers already indicated, there are those of periodical and vicarious congestions of organs, and particularly of the lungs, which we should do all we can to avoid.

MANAGEMENT OF EPIDEMICS.

A lengthy report on this subject was read at the St. Louis meeting, in October, of the American Public Health association, by the chairman of the committee on epidemics, Dr. Bell, of the *Sanitarian*. The following are some extracts from it; the first relating to an epidemic of small pox in Paterson, New Jersey U. S.:

Previous to November, 1882 (the date of the formation of the local board of health), there had been 133 cases of small pox in the city, extending over the time from June 10 1882, to that date. Under the administration of the Health Committee of the Board of Aldermen, the disease was continually spreading, and the public became more and more alarmed at the sanitary condition of the city; hence repeated demands were made in the papers and by the public for that Board to create an independent board of health under our State laws, and to turn over to it the management of sanitary affairs. After great pressure this was done on November 16 1882; and it was remarkable to observe the effect this action had upon the public mind, and what threatened to become a panic passed away, and the people seemed to rest assured that the proper authority had assumed control.

Besides the great unrest that prevailed, the people were aware that the city was losing a large amount of money by the mismanagement of the epidemic; this loss was not only a burden to trade and manufactures, but the city itself had spent about \$20,000 in the various endeavors to check the spread of the disease.

As an illustration of how one important branch of the service was managed, the manner of buying and using vaccine may

be noticed. This important article was purchased from a person not skilled in the selection of the virus, hence the vaccinations were in a large number of cases total failures.

When the Board of Health took charge the following plan was pursued:

A notice of the existence of a case of small pox being received the Health Officer immediately visited the house. If the case could be safely isolated in the house, arrangements were made for strict quarantine, and the family was made to understand that it was only by favor that the patient was allowed to remain in the house, and not taken to the city hospital. The family was also informed that any breaking of quarantine would be followed by quick punishment. Quarantine at home was only permitted when but one family occupied the house. Every person in the house except the sick was immediately vaccinated. A placard was placed on the house warning all persons not to enter or leave, except the physician in attendance and the Health Officer.

Upon recovery of the patient he was given a thorough bath, and new clothes were put on. The bedding was removed to the hospital grounds in the ambulance and burned; sheets, blankets, and underclothing were soaked in a solution of sulphate of zinc; the room and all clothing left in the house were then fumigated by burning sulphur for twenty four hours. If it was impossible to isolate a patient in the house, he was immediately sent, with all his clothing and bedding, in the ambulance to the city hospital. All in the house and all persons in the neighborhood were vaccinated, and strict watch was kept over the house from which the patient was taken until the period of incubation was passed. In case of death, the corpse was wrapped in a sheet saturated with a solution of sulphate of zinc and buried as soon as possible.

The method thus outlined worked admirably and no extension of the disease took place. Success may be ascribed to the attention paid to details, and to the care with which vaccination was done.

One fact struck me forcibly while engaged during the epidemic: that was the number of cases which occurred in the filthy quarters of the city. It was remarkable that, with but few exceptions, the victims of the disease belonged to the

lawless class of the community: drunkards, abandoned women, the careless and shiftless.

. . . Prior to the formation of the Board of Health there had been 139 cases in the city; and when the Board commenced work there were 19 foci of infection to contend against. In November 1882, 13 cases were noted; in December, 31 cases; January 1883, 3 cases, during which month the disease was eradicated.

Attempts have been made also to control the spread of scarlet fever and diphtheria, by the adoption of stringent rules requiring first cases to be promptly reported by the attending physician, strict exclusion, and, in cases of school children, prompt notice to the school authorities prohibiting attendance. Competent persons are employed by the Board to take charge of disinfection, to visit infected houses and instruct the family in the methods of disinfection, and at the termination of the case to personally disinfect the premises. Exposure of a corpse, or a public funeral, is forbidden under a penalty of \$50.

. . . In consideration of the trouble taken by the physician, the Board allows a fee of twenty-five cents for each case reported. This fee is, of course, merely a recognition of the fact that a physician is entitled to compensation for service rendered, and is the first time, I think, that this has been allowed in the United States. While we have had no case of refusal to report, the fee is rarely claimed, and the Board has been compelled in many instances to make out the amounts due the reporters and to ask them to call and collect the same. We have heard nothing of the "rights" of physicians or patients being invaded by the action of the Board, or by the visits of the inspector; this exaggerated feeling being confined apparently to the English journals.

The detail of the measures pursued in Charleston, as described by Dr. Horlbeck, is very similar to the preceding account by Dr. Newton, and with the same satisfactory results. Every case of diphtheria, scarlet fever, measles, cholera, small-pox, and typhoid fever is necessarily reported at the Registrar's office, and promptly dealt with by the health authorities. The education of the people by constant supplies of clearly written and condensely

expressed circulars, never more than one page, containing formula of disinfectants with method of application, is the strongest vehicle which we possess. . . . The lesson taught is that the disease (small pox) can be kept in abeyance and eradicated [as can also all other epidemic diseases as well, *Ed. San. Jour.*].

TYNDALL'S THEORY OF EXPLAINING THE IMMUNITY OBTAINED AGAINST A SECOND ATTACK OF CONTAGIOUS DISEASE.

Professor Tyndall, in the *Pall Mall Gazette*, (*N. Y. Med. Times*), discusses the above subject in the following ingenious manner: "One of the most extraordinary and unaccountable experiences in medicine was the immunity secured by a single attack of a communicable disease against future attacks of the same kind. Smallpox, typhoid, or scarlatina, for example, was found, as a general rule, to occur only once in the lifetime of the individual, the successful passage through the disorder apparently rendering the body invulnerable. Reasoning from analogy, I have ventured to express the opinion that the rarity of second attacks of communicable diseases was due to the removal from the system, by the first parasitic crop, of some ingredient necessary to the growth and propagation of the parasite.

The cultivation of the micro-organisms, which is now everywhere carried on, enables us to realize the smallness of the changes which, in many cases, suffice to convert a highly nutritious liquid into one incapable of supporting microscopic life. Various important essays bearing upon this subject have been recently published in the *Revue Scientifique*. M. Bouley there draws attention to the results obtained by M. Raulin in the cultivation of a microscopic plant named *asperillus niger*. The omission of potash from Raulin's liquid suffices to make the product fall to 1-25 of the amount collected when potash is present. The addition of an infinitesimal amount of a substance inimical to the life of a plant is attended with still more striking results. For example, one part in 1,500,000 of nitrate of silver added to the liquid entirely stops the growth of the plant. And now we come to the important application of this fact which has been indicated by M. Duclaux. Supposing the *aspergillus* to be a human parasite—a living contagium—capable of self-multiplication in the human

blood, and of so altering the constitution of that liquid as to produce death; then, the introduction into the blood of a man weighing sixty kilograms of five milligrams of the nitrate of silver would insure, if not the total effacement of this contagium, at all events the neutralization of its power to destroy life. The index finger here points out to us the direction which physiological experiment is likely to take in the future. In anticipation of the assaults of infectious organisms, the experimenter will try to introduce into the body substances which, though small in amount, shall so affect the blood and tissues as to render them unfit for the development of the contagium. And subsequent to the assault of the parasite he will seek to introduce substances which shall effectually stop its multiplication. There are the stronger grounds for the hope that in the case of infectious diseases generally such protective substances will be found.

KOCH'S LATEST RESEARCHES ON CHOLERA.

(FROM PHILADELPHIA MED. TIMES.) §

Koch has two great qualities as an investigator—unequalled *technique*, and powers of patient observation. His experience has been vast, and each piece of work which he has done has been remarkable in leaving but little to correct, either by himself or by subsequent observers. No writer on mycology is more reliable; not one has proved himself worthier of professional confidence.

Doubts have arisen in the minds of many concerning the cholera bacillus, on account of the observations of Lewis, and of Finkler and Prior; and upon these we are glad to have Koch's criticisms, which have just appeared in the *Deutsche medicinische Wochenschrift*.

Lewis (*Lancet*, September 20, 1884) states that a bacillus resembling that of cholera can be found in the mouth, but Koch shows, in a very few words, that this form has been known for some years, that it differs from the comma form of cholera in being longer, more slender, and not so blunt at the ends; and it further differs in this all-important particular, that it will not develop in the weak alkaline pepton-gelatine, in which alone the cholera bacillus can be cultivated.

His criticisms on the work of Finkler, and Prior, on cholera nostras, show how necessary it is for men to have a proper preliminary training before undertaking such investiga-

tions. From their own statements he easily proves that they could not possibly have obtained pure cultivations. They appear, also, to have been so far astray as to mistake the part of the bacillus which all observers regard as the spores. After considerable difficulty Koch obtained some of their culture material, and found it in four different microbes, of which one resembled slightly the comma-bacillus, but is larger and plumper, and in its mode of growth quite different, growing much more rapidly in gelatine or on potatoe, and showing unmistakable differences in the form assumed in the cultures. It is a totally distinct micro-organism, and very probably has no special connection with cholera nostras. The culture which Finkler and Prior made was from stools which were not quite fresh, but they had preparations from fresh stools which were believed to show the comma-bacillus, but those which Koch examined contained only the ordinary intestinal forms.

Three cases of undoubted cholera nostras have since been examined by Koch, and neither in the stools nor the intestines could comma-bacilli be found, nor did they develop in cultivations.

He remarks, in conclusion, that the experiments of Rietsch and Nicati, on the production of cholera in animals, have been successfully repeated in the Berlin Hygienic Laboratory. The material of a pure cultivation was so far diluted that the quantity injected did not contain more than the hundredth part of a drop. When placed in the duodenum the animals died in from one and a half to three days. The mucosa of the small intestine was reddened, the contents watery, and the comma-bacilli were found in extraordinary numbers. The condition was similar to that of the intestines of a recent human case. The exceedingly small amount injected precludes the possibility of an intoxication produced by the action of any poisonous product.

These latest observations of Koch afford additional strong confirmatory evidence of the correctness of his views concerning the etiology of cholera and its connection with the comma-bacillus.

IN AUSTRIA, during 1883, there were twenty thousand, three hundred and twenty-three twin births, three hundred and fifteen triplets, and one quadruple birth.

COW'S MILK AS A VEHICLE OF DISEASE.

The possibility of the transmission of infectious and epidemic diseases through the agency of cow's milk (*Phil. Med. Times*) has become a well recognized fact. Since Dr. Ballard published his report of an epidemic of typhoid fever at Islington, in 1870, attention has been directed to this source of dissemination of disease, and the result has been a record of at least one hundred epidemics alleged, upon reliable grounds, to have been traceable to milk which had in some way or another become specifically contaminated.

It seems to be an established fact that scarlet fever has been communicated in this manner, and there is reason for supposing that diphtheria has also been thus disseminated, although the evidence on this latter point is not so thoroughly conclusive. Other infectious diseases are believed to have been occasionally propagated through milk, but more proof is needed to reduce the opinion to one of scientific accuracy. However, as we are in possession of certain well-known facts, in regard to this mode of disseminating typhoid fever and scarlet fever, and knowing what we do of the nature of infectious diseases, and with our knowledge of the property in milk of readily absorbing volatile matters in the atmosphere, and of the circumstances attending the collection, treatment, and handling of milk before it reaches the consumer, it is not hazardous to venture the opinion that all infections may be transmitted by milk, and that this possible source of danger to health should be guarded against accordingly.

It is known that milk containing a fungus—the *Oidium Lactis*, or *Penicillium*—may give rise to irritation of the stomach, or even gastritis. Milk from an inflamed udder will cause inflammation of the mucous membrane of the mouth and aphthæ on the lips and gums. The so-called milk sickness, at one time prevalent in the Western States, is supposed to have been caused by the milk of cows which fed on the *Rhus Toxicodendron*.

Very positive evidence has been adduced to show that the milk of cows affected with the foot and mouth disease will give rise to a somewhat similar affection in the human subject. It is not so clear how milk becomes the means of conveying the poison of enteric fever, scarlet fever, and possibly some other infectious diseases. In the case of typhoid fever communicated in this way, the majority

of epidemics have been regarded as due to specifically contaminated water which had been added to the milk. In other instances of typhoid fever, and in the case of scarlet fever, and perhaps diphtheria, a common explanation is that the infectious material has been absorbed by the milk. It has also been suggested that the milk thus infected may act, while warm, as a cultivation fluid for the zymotic germs. Other explanations have been proposed, but they do not materially modify the general precautions, which, in the present state of our knowledge, are deemed most efficacious in preventing this mode of transmission of disease.

Dr. Thursfield, an English medical officer of health, who has investigated the subject of milk epidemics very carefully, proposes certain precautions which he considers effectual in preventing these outbreaks of disease. The responsibility is divided between the consumer and the sanitary authorities. He urges upon the consumer the precaution of boiling all milk. There is a prejudice against this practice, but it ought to give way if it be true that "to boil milk may, for practical purposes, be said to confer immunity from infection conveyed by it."

The milk-shop of the retailer and the dairy of the wholesale purveyor should be placed under the strict control of the sanitary authorities, which should be clothed with power to make proper regulations and to enforce them by the aid of efficient inspection. The organization of such a service would at first be arduous, but so soon as its requirements are made known and intelligently comprehended, a willing co-operation might be expected in most cases. There is a prevailing ignorance of the facts above stated, which is damaging to the best interests of the public health and ought to be removed. In no way can this be better accomplished than by the organization of an authoritative service regulating the purveying and sale of this important article of food.

HERODOTUS, 484 B. C., (*Detroit Lancet*) said that in Egypt there was a particular physician for each disease. "The art of medicine is thus divided amongst them; each physician applies himself to one disease only and not more. All places abound in physicians; some physicians are for the eyes, others for the head, others for the teeth, others for the parts about the belly, and others for internal diseases."

DR. LOOMIS, (N. Y.) says a man is young or old just in proportion as his arteries are healthy or diseased.

THE HOME OF CHOLERA.

Koch, in a late address on cholera (*Med. Press and Cir.—Detroit Lancet*) says that the only focus of cholera is the Ganges Delta of India. The upper portion of the delta is inhabited, but the base comprising an area of seven thousand five hundred square miles, is uninhabitable. In it the great streams, Ganges and Brahmapootra, lose themselves in a network of water courses, in which, with the ebb and flow of the tide, the sea water mixed with the river outflow, moves backward and forward and at flood tide covers wide reaches of the triangle.

A rank vegetation and rich fauna have developed in this unhabited country, inaccessible to human beings, because of the inundations, tigers and pestilential fevers which attack all who attempt to stay long in this region. The enormous mass of organic matter always wet, and always hot as a tropical sun can make it, furnishes all the conditions for the rank development of micro-organisms. When under these conditions it is remembered that enormous quantities of dejecta are being constantly carried into this putrefying mass, nothing seems to be wanting to promote the worst of organic growths.

If once the cholera germs be cast into this cesspool, it is not clear how the development of cholera in those who live adjacent to it can be avoided.

It must also be remembered that each of the houses in the country bordering this cesspool, can only be constructed by digging a deep hole from which sufficient earth shall be obtained to make a foundation sufficiently above the marsh to avoid inundation. These holes become filled with water. From them the natives get water, in them they wash, and into them flows more or less of their dejecta.

As the holes have been filled up, and a pure water supply afforded, so has cholera disappeared. As a proof of this, in addition to other facts he gives the history of Calcutta. The fort is not sewered, and cannot be. Formerly the garrison was attacked by cholera every year. But in 1860 attention was paid to the water supply, and from that date cholera has disappeared from the fort. All other conditions remain exactly the same. The only difference was in the water. As this has continued for nearly a quarter of a century, it is fair to believe that the soldiers

in the fort took the cholera from their drinking water.

The spread of cholera by the millions of pilgrims who journey to Mecca, drinking and defecating and washing in the same pools, is familiar to all, but it still further serves to establish the author's proposition.

THE TORONTO SANITARY ASSOCIATION, we are pleased to learn, seems to be in a flourishing condition. At the regular monthly meeting in November, in the lecture room at the school of Technology, Mr. Henry Langley, the president, occupied the chair. Mr. Alan McDougall, C. E., &c., secretary, announced that the membership was then 90, a great increase since its organization 5 or 6 weeks before. A number of new members were elected. Dr. Ellis delivered a lecture on "Drinking water"—in the course of which he said, the water of the Ottawa was comparatively pure, having only about four or five grains of mineral to the gallon. The Thames contained about fifteen grains. The St. Lawrence contained from ten to twelve grains. In some lakes there were only four or five grains to the gallon, while in lake Ontario the water contained nine grains to the gallon. The matter consisted of sulphates, carbonates, and chlorides of lime, magnesia and sodium and other substances.

SQUALID DWELLINGS AND INTEMPERANCE.—Repeatedly and years ago has this JOURNAL urged that the wretched dwellings of the poor lead to intemperance. By neglecting the great industrial masses, the more refined, the educated and the well to do are dragged down in a measure and suffer, often in health, often in morals, and hence it becomes directly to the interests of these latter to help the poor. At the late meeting at St. Louis of the American Public Health Association, a paper on the squalid dwellings of poor, was contributed by Dr. Chas. W. Chancellor, secretary of the State Board of health of Maryland. He said the question had a most important bearing upon the public health. It was most important that the public should know the existing state of things and apprehend the hazard and risk which was involved by their continuance. If an investigation

could be made of the unsanitary condition of the dwellings of the poor in the large cities of America, it would reveal a frightful picture of vice and misery. It was well known that the lower classes were much given to intemperance. There was no real reason for that, unless it was that the sense of their misery superinduced the diseased craving for stimulants. It would be well if social reformers would regard intemperance from that point of view, as it was quite certain that the misery and squalor of the poor was largely the cause of intemperance amongst them. The great industrial classes of the country were entitled to protection, both as regarded their health and their avocation. Therefore it was necessary that there should be vigorously administered laws for the protection of the health of every citizen, and especially over the health of the industrial population should every safeguard be placed. A nation such as this, with 55,000,000 of people and vast manufacturing, industrial and agricultural interests, should protect the health of its citizens most adequately, as disease paralyzed labor and wasted capital.

RETENTIVE POWER OF INFECTION.—Certain facts, says a London Exchange, have recently been brought to light with respect to an outbreak of cholera in Constantinople in the year 1874, which possess more than ordinary interest at the present time. In August 1871, an epidemic of cholera was rampant in the city, and a certain number of patients were lodged in an old "Hôpital." In one particular ward the mortality was very great. At the close of the epidemic the old hospital was pulled down and a new stone building erected in its place. From motives of economy, however, the same ground plans were employed for the new hospital. In the case of the room which had been so peculiarly fatal at the time of the epidemic, it was not thought necessary to take up the old flooring or in any way to alter it. Two years later, at a time when there were no cases of cholera in or about the city of Constantinople, or indeed in any other part of Europe, one of the male nurses in attendance on the sick in this same ward was suddenly seized with all the symptoms of Asiatic cholera, and died in six hours. Two other cases occurred in the next twenty four hours

with equally rapid and fatal results. Energetic measures were then taken by the medical officer and the whole of the contents of the infected ward were rendered innocuous, the flooring which had undoubtedly harboured the infective material being completely burnt. Within a short period the ward was again fit for occupation, and has been continued in active use to the present time.

CREMATION NOTES.—The corner stone of a crematory temple was laid at Mount Olivet, Long Island, New York, on November 20. The proposed edifice is being built by the United States Cremation Company. Twenty bodies already await incineration. The cost of the building is about 10,000 dols., that of incineration 10 dols. to 25 dols. The building is in the shape of a Greek temple, 40 by 72 feet. Incineration will take place at a temperature of about 2,500° F. It will require about forty minutes per 100 pounds of the subject, and will leave about 4 per cent. in weight of a pure pearly ash. No smoke will be visible, and no odour perceptible during incineration. The basement will also contain a *refrigidarium*, where bodies may be kept when desired awaiting the arrival of friends from a distance; also a *calidarium* for cases of possibly suspended animation, the high temperature of which will induce speedy evidences of life or death, as the case may be. There will be also in the basement an *adicularium* or urn room, and an atelier. This last will be used also for making autopsies, which will be required in all cases wherein it is not clear that death is the result of natural causes. The body of the building, or the ground floor, will be fitted up as a chapel, where any service desired may be held. The Italian Government has ordered the building of a crematory, on the Gorini-Gozzi system, for the cholera hospital at Varignano. It is proposed as a measure of economy to burn the dead paupers of Brooklyn, instead of, as is at present the practice, burying them in two-dollar soap boxes. The Cremation Society of England announce that they are prepared to undertake cremations under due restrictions and certificates, particulars of which may be obtained by communication to Mr. William Aassie, C.E., honorary secretary of the society. A crematorium is talked of in St. Louis, Mo.

Leading Articles.

THE WORK OF MEDICAL HEALTH OFFICERS.

In the October number of this JOURNAL we drew attention to the desirability of medical health officers paying special attention first of all to the proper disposal in their respective municipalities of the daily excrete matters, especially human excreta, in order to prevent pollution of the air and, especially, the drinking water supply; air and water polluted by the excrete matters, specific and otherwise, being by far the most prolific cause of disease. We also then drew attention to the desirability of health officers next giving their attention to the milk supply—the cows, that they be not diseased, the byres and the dairies, that there be no case of infectious disease in persons connected therewith. We now propose to refer to the isolation and disinfection of cases of infectious disease with the view of preventing the spread of the disease.

In arranging for the prompt suppression of outbreaks of epidemic diseases in a municipality, the authorities must necessarily provide for notice being given to the health department of every case of infectious disease. In Ontario, the last public health Act requires this notice to be promptly given in all cases. It does not appear that there has ever been any opposition to this measure, though seemingly there has been much indifference, such as there usually is at first to all measures of this nature. The health authorities in the municipalities in this Province would have little difficulty now in overcoming this indifference and obtaining information of every case. And in the other Provinces, until a similar law is passed, which it is greatly to be hoped will not be a very long time, where there is a local health board, arrangements might be made whereby like notice would be given by the medical practitioners in the locality. And in this connection we might draw attention to the article on another page on "the management of epidemics," especially, as referring to this particular point, to the last paragraph but one.

Having learned that there is a case of epidemic disease in any family or house, very much might in most cases be done by the health officer visiting the house and representing the great importance and practical value of careful isolation and disinfection in preventing the spread of the disease even to other members of the family, where such exist. While vastly more may be done as a rule where a law bearing upon such cases is in force, much may doubtless be done amongst intelligent people, even in the absence of such a law, by advice and persuasion, and where there is the law, a little timely reasoning will aid greatly in having it properly carried out. The quarantine should be as strict as it is possible to make it—the stricter, of course, the less likelihood is there of the disease spreading. The patient should be in the highest or most out of the way part of the house, and communication between the sick and the well should be reduced to a minimum—confined indeed to physician and nurse, and when necessary, the health officer.

The process of disinfection may be considered under two different aspects—that during the progress of the disease, and that affected by the health department after the termination of the disease. The first is the more important of the two. As the *Glasgow Sanitary Journal* properly has it, "disinfection to be of any avail, must commence at the very beginning of the illness and be carried on to the termination thereof. To allow a case of illness, from an infectious disease, to proceed to its termination, and then to evoke the aid of the Sanitary Authorities in the so-called disinfection of bundles of clothing, soiled linen and bedding, and in the fumigation of the house is, in most cases, a mere sham." "The first and most important step in practical disinfection consists in the isolation and imprisonment of the contagium, the final destruction thereof being a comparatively easy matter. In fact, the destruction of the contagium is in general a necessary sequence of its isolation and imprisonment. But if the contagium be allowed to escape and to diffuse itself throughout the whole of

a house, the destruction thereof, after the conclusion of the illness, becomes a practical impossibility. In such a case the burning of sulphur, the evolution of fumes of chlorine gas, or of carbolic acid vapour, is little better than a farce, and can only give a fancied security. We do not by any means underestimate the value of such fumigations; but we maintain that they constitute one phase only of disinfection, and that the final. The same remarks apply with equal force to the disinfection of clothing, bedding, etc., by means of dry heat or steam."

There is much truth in all this, and yet disinfection in the sick room during the progress of the disease, as too commonly carried out, is of little avail. There is something to be considered besides the destruction of the contagium. The atmosphere of the sick room must not be rendered irritating to the lungs of the patient, and if opposition is to be avoided, reasonable consideration must be given to the preservation of clothing and bedding. The medical health officer for Glasgow, Dr. Russell, in an address at a meeting, November, 1884, of the West of Scotland Branch of the British Medical Association, of which he is President, said, "the air of the apartment must first of all be respirable; and if it is respirable, it cannot be disinfected. You may deodorise it by faint evolution of chlorine or sulphurous acid, or dissemination of carbolic acid, or by the more æsthetic and agreeable aromatic vinegar, or eau-de-Colonge, or you may follow the fantastic suggestion of another author, and moisten the heads of matches so as to liberate ozone! but this is the mere delusive ghost of disinfection. There is probably little harm done by saucers with chloride of lime placed about the apartment, or sheets soaked in carbolic acid draped over the doorway, or Condy's fluid sprinkled on the floor, or any other of these inane proceedings. The worst that can be said of them is that they may give a sense of false security, and divert attention from free ventilation and scrupulous cleanliness. The sensations of the patient and attendants will keep them within the limits of innocuousness. Still, they par-

take of the same character as much of the more serious public practice of disinfection which Simon has described as a futile ceremony of vague chemical libations or powderings, . . . savouring rather of superstitious observance than of rational recourse to chemistry."

Abundance of fresh air, the best of all disinfectants, should in some way in all cases be admitted into the sick room. If in warm weather a free flow of it should be provided for by two large openings of windows or door and window. In cold weather, if possible there should be an open fire or a large opening into a warm stove pipe or chimney. If abundance of fresh air be not admitted the contagium becomes concentrated and will pervade the whole house in spite of any practical isolation or disinfection, as it is well-known tobacco smoke for example will from any room in a house. "Direct sunlight, fresh air, soap and water are the most important of all disinfectants, chemical and other disinfectants being merely supplementary, and adapted to complete the process or cover the chapter of accidents." The old fear of fresh air, soap and water, has now largely passed away. The writer has known numbers of cases of fever in quite cold weather do remarkably well in a room with one window sash removed and cool air blowing freely through the room, so arranged with door or another window, that the air of the room would not pervade the house but be blown out.

Quoting again from Dr. Russell's address: "What Baxter thought was probable many years ago, I believe is certain, that all contagia disappeared sooner or later under the influence of air and moisture. The contagia which impregnate the breath are moist, and if they float out into the open air their career as living forms soon terminates. So with the cutaneous exhalations. Hence typhus, which spreads like wildfire, with personal uncleanness and overcrowding, is absolutely disarmed by cleanliness and ventilation alone. The contagia of the urine and feces are still more moist, and so farther on the way to destruction at the outset of their career. If

their moisture is rapidly evaporated, so that the solid ingredients become dust, then they are endowed with the longevity and far-reaching infectiveness of all dry contagia. The most dangerous and long-lived of all contagia are those which begin their external career in this state of dryness; of these scarlet fever and small-pox are the most striking illustrations. They impregnate the atmosphere of the room, and make it highly infective. Yet we can do nothing to destroy this infectiveness, but trust to the natural disinfectants—air and moisture—which, in this climate, any hygroscopic body soon acquires. We may, however, by applications to the patient's body, clog the wings of the contagia, and retain the debris to be removed by the bath. In water all contagia are drowned at once, in the sense of being imprisoned, and if the bulk of water be sufficiently large in proportion to the organic matter, decomposition proceeds apace, and they soon cease to exist as vital entities. There are only two circumstances which may give them another opportunity of infection, one is if they contaminate the water supply, the other is, if from defect of bulk of water and stagnation, gaseous bubbles project them into the air, or the filthy solution smears the sides of sewers above water level, or deposits mud which is exposed to the sun and the sweep of currents of air," as too frequently occur.

The excreta from the bowels and kidneys, and in some cases the sputa, should, however, be received into a strong disinfecting solution. Where possible, as in cases of scarlet fever, especially, and even of measles, oily inunction of the entire surface should be practiced. This will not only check the spread of the contagium in the dried cuticle, but will prove soothing and useful to the patient.

We must defer for another occasion the consideration of that part of the disinfecting process—of the clothing, bedding and room or dwelling—which follows recovery.

Dr. Alfred Carpenter urges the amalgamation of all the sanitary organizations in England into a royal institute of health.

TYPHOID FEVER.

In the destruction of valuable human life, next to that most destructive of all diseases, consumption, comes typhoid fever. This disease seems as it were to revel in the destruction of the most valuable lives, and almost daily we learn of one or more of the best men in the Dominion, and they too in the prime of life, falling victims to it.

It seems as plain as can be, as repeatedly explained in this journal, that the origin or cause of the disease—its specific contagion—is most intimately associated with human excreta, and that the poison is usually communicated through the medium of drinking water. It is probably but rarely if ever communicated directly from one person to another, but develops and multiplies outside the body. Though not positively proven, there seems to be hardly any doubt whatever, as everything in the history of the disease seems to bear witness, that the contagion is some phase of a sort of mould, the favorite, if not the essential, soil for the development of which is fecal matter—fecal matter adhering to the surfaces of drains or sewers, or in cesspools or privy vaults. And it is very universally believed that, to get rid of the fecal matter, completely and entirely, is to get rid of the fever.

Notwithstanding all this, pointed, out to the public over and over again, there are in the "Queen City"—Toronto, between 14,000 and 15,000 privy vaults, and in the Dominion probably not less than a million of them, for storing and actually preserving this soil for the development of the typhoid poison, which is so constantly destroying the lives of the ablest and most useful men.

We need hardly allude to the remedy. It is plain enough; consisting simply in the disposal of the excreta of the body as civilized beings and Christians should. The present system and manner of constructing drains and sewers in connection with our houses is highly dangerous, and doubtless costs thousands of most valuable lives. The

only absolute safety is in the complete disconnection with sewers, not easily accomplished, or in the use of earth or ash closets. The objection heretofore often raised, that the difficulty in obtaining a supply of dry earth made it almost practically impossible to make the use of earth closets general in large cities, is now entirely overcome by the manufacture of the ashes closet. In every household are abundance of ashes for the purpose indicated.

When will people learn how easy it is to prevent typhoid fever and such diseases, especially by a little united effort? And when will people learn to so value life as to act practically upon what they learn in this behalf?

WINTER VENTILATION.

This is a subject that is greatly misunderstood. People are prone to think that all that is required is to provide an opening by which fresh air can enter a dwelling; whereas, the great and most important thing is to provide means for the removal of the foul air. If the foul air be withdrawn, fresh air will find its way into any dwelling to take the place of the withdrawn air. Especially will this be the case in the winter season when the outer air is so much colder than that within. By simply providing an opening of sufficient size in a warmed chimney flue or stovepipe in the room, the breathed air of almost any room may be constantly removed, and the atmosphere of the room maintained at a fairly healthy standard. From any tinsmith may be obtained a link of stove-pipe with an opening in one side, about 6 inches by 7 or 8 inches, fitted with a sliding piece by which the opening may be closed or opened, or made small or large, at will. If any one will try the experiment of fitting a link of this sort into a stove-pipe passing through a bed-room occupied by one or two persons, which before had no such means of ventilation, keeping the pipe warm during the night and the

ventilator open, and observe the difference in the atmosphere in the room in the morning, as by going from the outer air into the room, he will readily notice the marked difference in the condition of the atmosphere of the room after the experiment. From being stuffy and disagreeable it will be fairly pure and agreeable. Fresh air from the outside will have found its way in through the cracks and crevices about the window or windows to take the place of the breathed air being constantly withdrawn. With an open grate fire or open stove such outlet of course would not be necessary. With the usual close "air tight" stoves, however, some such means for ventilating is indispensable to health, and two or three or more such ventilators in a dwelling, according to its size, would add very materially to the health and vigor of the inmates, and tend to prevent colds and other attacks of illness.

SELF-CONTROL

Whatever may be the immediate source of the mind, whether it is or is not the result of brain action, and though man is in a large measure the creature of circumstance and subject to the influences by which he is surrounded, there can be no doubt whatever that the physical organization of man is yet largely subject to his mental influence and may by education be brought entirely under the control of his will. It is chiefly in the subjugation of his impulses to the power of reason, of his inclinations to the influences of judgment, and of his desires to a sense of duty, that man differs entirely from all other animals. And it is by the cultivation and development of these higher faculties—of reason and judgment and of the sense of duty, that man acquires a habit of self-denial and self-control. It has been said that "he who has acquired this habit, who can govern himself intelligently, without painful effort, and without fear of revolt from his appetites and passions, has within him the source of all real power and of all true happiness." He

who has acquired this habit has within him, too, not only the greatest safeguard against the encroachments of disease, but that which will contribute more than anything else to his restoration to health should he by any mischance have become diseased; for he will naturally be truly temperate in all things, and will have a powerful will. How very important it is then that this habit should be cultivated from almost the earliest period of life, at least from early childhood—cultivated at home and at school. Yet how very little special attention is paid to this most important part of education. On the other hand, children are far too commonly allowed, either from affection or indifference, to follow unchecked their own impulses, inclinations and desires. In permitting this, parents make a terrible mistake, and sacrifice the future happiness of their children. The power of self-control is weakened too by permitted disregard, partial or complete, of parental or other authority when efforts are made to have such authority exercised. It might well be ever borne in mind by every parent that the son becomes a man and the daughter a woman in proportion to their power of self control. And to develop this power in the child may well engage the constant and serious attention of every parent.

Matters Recent and Current.

OF TYPHOID FEVER, Toronto appears to be "reaping a whirlwind." Will the people of the city now pause and consider what they would have saved—saved in health, in wealth that has gone to the doctors and druggists, in valuable life, if ten years ago, when strongly urged in this JOURNAL to build a trunk sewer, they had built it, or in some other rational way disposed of their sewage? And will they pause and consider what they may yet save in the next ten years, if, instead of continuing on in the same course, they at once set about what they know to be the necessary work. The city foundation is honey-combed with foul privy vaults and bad drains and sewers, and the typhoid and other prevailing diseases are the most natural and oft pre-

dicted result. The people of this wealthy city dwell on and fear the costs of the remedy; do they count or dwell on the costs—ten times greater, of not applying the remedy? It is safe to predict that if cholera should take root in the prolific soil of the city next summer it would yield such a crop as would cost a hundred times as much as it would to thoroughly clean the city and provide it with a pure water supply.

SOME LEADING PHYSICIANS in Toronto have been giving a *Mail* reporter, early this month, their opinion on the situation. Dr. H. H. Wright believed there were an unusual number of cases of typhoid in the city, and attributed it to the water supply. Dr. Aikins gave a like opinion. Dr. Covernton said a most frequent cause of the fever was drainage from privy vaults into wells, one remedy would be found in the employment of earth or ashes closets. Dr. Barrick thought there were many cases of malarial fevers, and that there was a disposition to call too many cases typhoid. Dr. George Wright thought that earth or ashes closets should be used, or the water closets be disconnected altogether from the houses. Dr. Oldright mentioned cases in which bad plumbing has been shown unmistakably to have caused fevers in certain houses. The reporter learned from Dr. O'Reilly that there had been, during last year, 158 cases of typhoid fever in the hospital. Of these, 17 had proved fatal; some being in an almost dying state when brought to the hospital. The proportion of deaths was much lower than in most large city hospitals.

SMALLPOX has again made its appearance in Sidney, New South Wales. A contemporary states that "under our local laws we deal with it very trenchantly. Doctors and householders are bound under a penalty to report every suspicious case. Whenever the disease is pronounced to be smallpox, the patient is, if willing, removed to the quarantine ground, as well as all the persons who have been living in the house. The premises are then disinfected and quarantined for 21 days. In this way we have stamped out smallpox more than once, and hope to do it again; and the opinion here is that if in Europe and America the same vigorous policy were pursued, smallpox would be stamped out there too, and Asia alone

would remain as the danger to the world. This time none of the patients have died, and there has been only one new case during the last week. All the cases but one have been developed in somewhat unsanitary abodes." Nothing is said about vaccination, nor re-vaccination.

THE QUARANTINE TERM for smallpox in Victoria is only 14 days, while in New South Wales it is 21. "The medical authorities," says an exchange, "do not agree as to the term of the incubation of the disease, and on this point a bit of evidence has just turned up which will be of interest to the Faculty in England as well as in Australia. Last week the health officer in Melbourne pronounced the colony clean because 14 days had elapsed since the isolation of the last patient. But within 24 hours the husband of this patient was found to have contracted the disease, so that a 14 days' quarantine is proved not to be sufficient."

OVERWORK IN SCHOOLS.—After forty-two years experience in Germany it is now conceded that physical exercise is not a sufficient antidote to brain-pressure, but that where the evil exists, the remedy must be sought in the removal of the cause. Official action with reference to over-pressure has been taken into Prussia, Saxony, Wurtemberg, Baden, Hesse, and Alsace-Lorraine, in England, investigation is being made, and on another page reference is made to over-pressure in Scotland; in the United States those interested in the public welfare are calling upon educational authorities to pause before serious mischief is done. Are we in Canada spending vast sums of money in "education" which may be doing vital injury to future generations? It is easy to over-do anything.

OF OVERPRESSURE in Scotland, there appears to be a deplorable amount among growing girls of the better class. Dr. Keiller recently devoted a whole address—the last of his course of Morison lectures—to the subject (*Med. Times*), and his strictures have been confirmed by several letters addressed to the *Scotsman*. Dr. Keiller said, "knowing that the highly-forced education of our time is often at the very root of the first breaking down of the health of

young girls, by not only inducing various forms and degrees of early neurosis, but by stamping on their developing natures features of diminishing strength, and that at an age when health and strength, when physical building up and fresh nerve force and brain power, instead of being in any way exhausted, should be carefully tended as being of vital importance to their ultimate welfare." Dr. James Carmichael thoroughly endorses Dr. Keiller's views and inculcates especial caution in imposing brain work on growing girls, as the evil effects are not immediate but remote. "A girl's general health does not appear to suffer when she is at school, but in after life when she attains to womanhood, and the strain of maternal duties are imposed upon her. It is then that she is so often found unequal to the task." Mr. Balsilli, again, writing from the educationalist's point of view, admits the existence of serious over-pressure in secondary schools, especially among girls, as "a fact well enough known already," and not requiring further proof.

A SEWAGE FARM FOR TORONTO, the *Mail* argues, would hardly be practicable, because 1,000 acres of land would now be required for the use of the city. Surely several thousands of acres of land east of Toronto could be obtained for the purpose if necessary, and would be required to supply the city with abundance of vegetable foods, dairy produce and beef and mutton. When the trunk sewer is built, Toronto should by all means provide for a sewage farm, and not pour the sewage into the quiet waters of Lake Ontario, which would only half remedy the present trouble.

THE PULLMAN SEWAGE FARM in Illinois is probably the most extensive example of the purification of sewage by the downward intermittent filtration system now in operation on this continent. The farm is three miles south of the city of Pullman, the sewage of which it receives, and to which it is conveyed through a large iron pipe. The farm has been in operation three years. Full cars of produce have been shipped to various large cities, such as Vicksburg, Pittsburg, New Orleans, Atlanta, Memphis, and as far east as Hartford, and south to Galveston. There is a dairy supplied by Holstein cattle on the farm. According

to the *Chicago Sanitary News*, "The crop of 1883 paid 8 per cent on the investment; the crop of 1884 was larger, but the prices prevailing were somewhat lower. There is no question about the success of this farm, and its history is a valuable one for the numerous cities now considering the question as to how to get rid of sewage."

AT A NEW YORK ACADEMY OF MEDICINE meeting recently, in a discussion on the cholera epidemic at Suspension Bridge, in 1854, and its lessons, Dr. A. L. Loomis, of New York, said he was "of the impression that the specific poison of cholera, like that of typhoid fever, must undergo changes after leaving the human system before it would become able to impart cholera to the healthy person. He did not believe that cholera could be developed spontaneously but that its native place was Bengal, from where all epidemics in different parts of the world could trace their origin." This seems to be in accordance with the views, for the most part, of other authorities on the question. It may be possible, however, that the changes in the specific poison may take place, in favorable conditions, while in the alimentary canal, as well as, at other times, outside the body; as, for example, when there are in the canal accumulations of fermenting fecal matter.

IN REFERENCE TO CONTAGIONS there is evidently a great deal yet to be learned. While Klien has been dining off a dish of raw cholera bacilli, experiments at the Berlin Hygienic Laboratory have proved, it appears, that these microbes when injected into the duodenum of animals give rise to unmistakable symptoms of cholera and death of the animals, as detailed on another page. Furthermore, the experiments of Drs. Maurin and Lange, referred to in the October number of this JOURNAL, have demonstrated that the bacilli are innocuous as bacilli, but that when they find a suitable soil they develop a mucus or mould which these experiments regard as the true cholera poison. If all this be considered together, it might be inferred that in certain conditions of the stomach and bowels the bacilli might be swallowed with impunity—they might be digested, or, even escaping destruction in this way, fail to find suitable soil for development of the real

poison or mucus; while in certain other conditions of the alimentary canal they might meet with conditions favourable for such development, and so produce the symptoms of the disease. If the practice of swallowing the bacilli were to become common, possibly all might not fare so well as did Klien. When we consider the marvellous characteristics of these lowest forms of life, and what effect the minutest chemical change may have upon them, as referred to by Prof. Tyndall (page 57) we need not be surprised at these seemingly conflicting results of experiments.

AT THE CHOLERA CONFERENCE held last month in Washington, D. C., Canada was represented by Dr. Montizambert, quarantine officer of Grosse Isle; Ontario, by Dr. Government, Chairman Provincial board of Health; and Toronto City, by the city health officer. The meeting was a representative one, all the State Boards, and about seventy-five of the City Boards being represented. Three committees were appointed: one on *Federal legislation*, one on *State action*, of which Dr. Government, of Toronto, was a member, and a third on *Municipal action*. The principal work of the first committee was that of framing a bill for the reorganization of the National Board of Health, and to take steps to prevent vessels from infected ports landing, unless previously fumigated and disinfected. The report of this Committee was adopted and the Committee was instructed to confer with the Public Health Committee of Congress. The draft of a bill was read, and the members of the Public Health Committee of Congress expressed themselves as in harmony with the principles of it. The Committee on State Action reported favorably as to harmonious action among several States of the Union in reference to the cholera. The Committee on Municipal Action submitted a report containing recommendations which have been made over and over again in this JOURNAL.

INCREASED INTEREST IN HYGIENE, public and private, seems to be universal in all parts of the civilized world. The foremost men everywhere are showing their interest in the promotion of health, and papers and periodicals of all sorts devote a portion of their space to the education of the people in

health laws. As Juliet Carson writes in *Harper's Bazar* of the 17th inst., "early Asiatic naganism was clean to a degree, and bequeathed its habits to Israel and to classic Greece and Rome; but the first christians so far forgot the good example of their Hebrew progenitors as to confound that very classic habit of personal cleanliness with the hated worship of the kindly deities of the air and water which entered so freely into their scheme of life." It has taken a long time to find out the mistake, but a marked change is now going on.

DR. R. P. HOWARD, of Montreal, has been elected one of the three vice-presidents of the ninth International Medical Congress, which is to be held in Washington, D.C., in 1887; the other two vice-presidents being Dr. Alfred Stillé, of Philadelphia, and Dr. H. J. Bowditch, of Boston; Dr. Austin Flint, sr., of New York, being president.

BARAVANA MILK FOOD is another prepared concentrated article of diet manufactured by Messrs. Fish & Ireland, of Lachute, P. Q. It is a compound preparation of specially prepared farina of the healthiest cereals, thoroughly incorporated with concentrated milk, and forms a most complete and nutritious food, well adapted for young children and persons of weak digestion. It is, too, highly recommended by physicians as a diet for infants where the mother's supply of natural nutriment is wanting or is not sufficient. After the first few months of infantile life, especially, if not earlier, we should prefer it to condensed milk alone.

A PUBLIC DOON.—Owing to the difficulty experienced in the past in obtaining a supply of earth or ashes closets at a reasonable price, we had privately endeavored on several occasions to induce different manufacturers to make them on a large scale. We are therefore much pleased to learn that the joint stock company recently formed in Owen Sound for the manufacture of these closets, intend to make good low priced closets as well as the higher priced ones. Municipal health boards, nearly every one of which, in Ontario at least, this JOURNAL will reach, would do well to encourage in their respective municipalities agencies for the direct supply of these closets to the public. No other one thing would tend so greatly to promote the public health as the general use of such conveniences.

THE FOLLOWING IMPORTANT TESTIMONY in favour of "Heap's Patent" dry earth closets was given by Mr. Allan Macdougall, C.E., in the course of a lecture before the Toronto Sanitary Association, on "Sewers and Sewage, on the 12th inst. : "The dry earth system was the oldest sanitary system which we could trace. The numerous privies and out houses in towns and cities were a fruitful source of disease. After they had been used for a number of years the soakage would extend to an area sufficiently large to reach the wells in ordinary town lots. The dry earth system of closets was the best system of dry sewage, and would not endanger the public health. He produced a working model of "Heap's Patent" dry earth closets, as erected on the exhibition grounds in Toronto last September, entered by Mr. Wm. Heap, of Owen Sound. He had inspected these closets and found them to answer admirably. He understood that a number were now in use in Toronto. Dr. Canniff also strongly recommended the dry earth closet system from a sanitary standpoint.

CO-OPERATIVE LIFE INSURANCE, it is now often remarked by the far-seeing, is to be the life insurance of the future. There can be no doubt about this, as it is becoming very popular. No man who has any one depending on him for support, and is not possessed of sufficient means to leave such dependent in case of his death, should fail to make a provision in the way of life insurance. Common prudence and contentment of mind demand it. On the co-operative plan, the cost is less than half the usual cost in stock companies, because these base their estimates on an assumed high death-rate, which is hardly ever half reached; hence these companies rapidly become wealthy, as every one knows. The co-operative plan is the safest, because the management is all in the hands of the members themselves. According to a report of the Chief Engineer in England, the oldest benefit society was established in 1168, has existed over seven hundred years, and is still doing a good business. The next oldest was established in 1358, and has existed over five hundred years; and there are now existing eighty-nine benefit societies, which were established

in the seventeenth century, many of them having already existed for over 130 years. The "Ottawa Valley Provident and Life Association," of this city, of which Mr. Sparling, 2^d Rideau street, is the manager, offers some superior advantages for family protection; and special advantages are given to physicians who desire to become members.

THE LABORATORY AND FACTORY of Messrs. Read & Carnrick, New York, have been entirely destroyed by fire, through an explosion of a boiler, involving a loss of \$200,000. We are requested to state that the firm have already secured new buildings, and are working day and night getting up machinery, &c., and expect to be able by the 1st prox. to fill all orders for their specialties as usual. In the meantime they request the kind indulgence of the profession for any delay suffered in having their orders filled.

THE LATEST advices indicate that the bill prepared by the recent conference of state boards of health, at Washington, does not meet with the approval of the committee of the House of Representatives. It is thought the proposed board would be too large and unwieldy. The committee may recommend that the present board be continued.

IN THE SENATE, Senator Palmer, of Michigan, has presented a bill which provides for a bureau of health connected with the Treasury Department. It provides for a commissioner of public health, with a salary of \$4,500; seven superintendents at \$3,600; an inspector of ventilation, drainage and plumbing, at \$3,600, and a public analyst, at \$3,600.

IN THE ONTARIO AGRICULTURAL COLLEGE REPORT for 1883, Mr. F. G. Grensides, the veterinary surgeon, refers strongly to the danger to which the public are exposed from the consumption of meat from tuberculous animals. He thinks the loss to stock raisers, too, "must be very great, and will continue to become greater" unless more care is exercised in the selection of dams and sires. Greater care, too, should be exercised in the hygienic management of cattle, which require well ventilated but not too cold stables, and plenty of exercise in the open air. The choicest cattle often do not get exercise enough.

SEWAGE FOR FUEL.—Dr. Von Klein, of Dayton, O., claims to have perfected a process which will disinfect, solidify, and render sewage capable of being used as fuel. His process is altogether chemical, and the sewage may be treated under any condition of storage. Salt is added, then lime, which forms a chlorine gas that disinfects and deodorizes the sewage, and begins the process of solidification. Iron and nitrate of silver are then added, and this completes the process. In a few days the substance is ready to be made into conveniently-sized blocks for fuel. Two dollars worth of the sewage-fuel is said to be equal in heat-giving power to a ton of coal. The bricks resemble blocks of peat, and have no odor. When placed in a stove they burn readily with a strong blaze, and give out much heat.

THE WATER SUPPLY in rural districts is attracting a good deal of attention in England. The soil around all occupied premises, on farms as well as in towns, soon becomes saturated with waste excrete matters, and then the water of adjacent wells is sure to become impure. The connection between typhoid fever and foul water is universally recognized. Water seems to be the common vehicle by which the typhoid poison is received into the body. Water for domestic purposes should be obtained by boring deeply down into the earth, beyond the possibility of contamination.

SEVERAL DEATHS FROM DIPHTHERIA, according to the *Sanitary News*, have recently occurred among the children attending a school in Chicago. Complaint was made to the board by several citizens, whose families had been afflicted, and the board called for a meeting of all who had any complaint to make, or information to give. A preliminary examination of the buildings did not reveal any serious defects in the sewerage, but a deplorable state of affairs so far as ventilation was concerned. "A pretense of ventilation was found, which was worse than none at all. The children were fed not only with the poisonous emanations from their own lungs, but the foul air from other rooms in the building—the air being passed around from one room to another." Many physicians have drawn attention to the seeming

connection between bad ventilation and diphtheria, to which, from time to time, reference has been made in this JOURNAL. Most schoolhouses in both city and country places are in a deplorable state as regards ventilation, and parents would act wisely in looking after the condition of the school rooms in which their children spend a large part of the most susceptible period of their life.

SANITARY REPORTS.

THE REPORT ON MORTUARY STATISTICS.

We have received "abstracts of the returns of mortuary statistics for the last six months of the year 1883," of the cities which availed themselves of the system inaugurated about two years ago by the Minister of Agriculture for the collection of such statistics, the returns for the first six months of that year having been issued, and noticed in this JOURNAL, in the early part of last year. It contains a continuation of the tables of the first volume, for the last six months of the year, completing the work of the former report, with which this should be read.

This is quite a large volume and has involved a great deal of work, which has evidently been very carefully done. As the Deputy Minister, Dr. Tache, writes in the introduction, "it is quite generally imagined that the tables recapitulating the compilation of such statistics can be printed and published within the first few weeks after the year to which they relate; it is a mistake. The question is not merely one of expense and work; it is, moreover, a matter of counter reckoning, collating and exactness. With time and system it may be possible to publish promptly bulletins containing a certain portion of the information collected, when it seems useful and requisite to do so; but the returns, as a whole, involve delays which it is exceedingly difficult, if not utterly impossible to avoid, without sacrificing the principal point, which is accuracy."

Eleven cities were invited to avail themselves of this system of statistics, namely, Montreal, Toronto, Quebec, Hamilton, Halifax, St. John, N.B., Ottawa, Winnipeg, Charlottetown, Fredericton and Victoria, B.C.; all the capitals of the Canadian Confederation, and all the cities having, in 1881, a population of 25,000 inhabitants and over. Of these, six furnished information covering the whole year, 1883, namely, Montreal,

Toronto, Hamilton, Halifax, Ottawa and St. John, N.B. Charlottetown furnished information covering the last seven months of the year; Winnipeg six months, and Fredericton the last three months. Two cities, Quebec and Victoria, did not take action in time to follow up with the others, and these have therefore furnished nothing for the year 1883.

"It would be both premature and dangerous," as stated in the introduction, "to attempt to draw conclusions from these returns, which apply to but one year and constitute merely the inauguration of the practical operation of a new system. In official statistics there is no other alternative but that of publishing the information just as it is collected, without correction as to figures and without supplement as to omissions." Nevertheless, on another occasion we hope to be able to note some interesting features which the compiled tables bring out.

As to the working and value of the system, we will let some of the health and statistical officers of the various cities bear witness. In his report to the Minister of Agriculture, Dr. Trenaman, the officer in Halifax, states that, "the system adopted has worked fairly well." Dr. Daniel, of St. John, writes, "the system adopted has the merit of simplicity, works well now that it is in good running order, and I believe insures a very high degree of accuracy." Dr. Robillard of Ottawa, writes, "the practical results of the system inaugurated by the Government, aiding preventive medicine and Sanitary Science, generally, must be of great value, not only so far as the correct records of deaths, but also, as regards the causes of deaths, which in a sanitary point of view is at least of equal importance."

REPORT OF THE HEALTH OFFICE OF ORILLIA

Dr. Elliot, medical health officer of Orillia, on presenting his report for last year received a cordial vote of thanks from the council of that town for "his very valuable and elaborate report." The doctor states:—"It gives me much pleasure to be able to report a remarkably healthy condition of the town during the past season. We have been entirely free from epidemics of any sort. There has been no scarlet fever; no measles, and no whooping cough. . . . I think I may truly say there has been more practical

work done in this town in the way of sanitary reform, during the past season, than has ever been done before, but there is much remaining to be done before our town can be truly said to be in a proper sanitary condition. This, I trust, we may see accomplished during the coming season, when the Board has got more thoroughly into work, and the public are better instructed as to the requirements of the law and the conditions indispensable to the health of the community. Orillia has always enjoyed the reputation of being a healthy town, but, as the population increases the conditions which contribute to an opposite state are increased, and if precautions are not taken it cannot maintain its reputation.

Dr. Elliot proposes 1st. the adoption of some means of bringing the benefits and advantages of sanitary reform more prominently before the public, and educating them in those laws so essential to health. 2nd. The extension and more general adoption of our present water system, and the closing up of the wells in the more thickly populated parts of the town. 3rd. The extension and improvement of our present system of drainage, especially in the southern portion of the town; and the more careful removal and disposal of garbage and refuse of all kinds; also, that a by-law be passed making it compulsory for those living on the streets along which the mains are laid, to take the water and fill up their wells. The doctor says it is doubtful if there is a single well in the town which is not more or less contaminated by soakage of filth from the surface.

Publisher's Special.

For the eleventh time the SANITARY JOURNAL wishes its readers a "very happy new year"—for it is not yet too late, only a small portion of the year having rolled away. For more than a decennary the JOURNAL has been doing its best to prevent sickness, and has witnessed the birth and death on this continent of a good many journals started with a like object in view. No one knows so well as the publisher of it, and writer of this, how hard at times have been its struggles for life; and also how very difficult it is to interest those who are well in the cause of preventing sickness.

A great and progressive change however has taken place during the last ten years in the public interest taken in public health proceedings, and never in the history of the JOURNAL has so many subscribers been added to its list in the same period of time as during the last few months, and it is pleasing to believe that the most critical period of its life is over.

The JOURNAL is much pleased and thankful for the good things said about it by some medical health officers in their annual reports, and will in the future, as in the past, endeavor to merit such high commendations.

In the next number, it is the intention to further improve the appearance of the JOURNAL by the use of better paper.

If every reader of the JOURNAL would, as a few are good and kind enough to do, endeavor to get others interested enough in either public or individual hygiene to subscribe, they would greatly add to the usefulness of the JOURNAL and confer a public benefit. Every local board of health should have a few copies of the JOURNAL for the members of the board, and many of its readers could do much in this behalf, as some have done, and as it is to be hoped, all will kindly endeavor to do.

To the ever distasteful subject of "paying up" the publisher is forced to allude. Hundreds have been receiving the Journal from the first year who have not yet paid a dollar, though reminders &c. have been sent to them over and over again. The names of these we shall be forced to strike off the list unless we hear from them in some way in a few weeks.

A good many others have not "paid up" for the past two or three years, and from these we should be very glad to receive a remittance. A good many accounts will be sent out now at once and we trust all will respond and kindly remit the amount at an early day, and save the always disagreeable trouble of sending another account.

Literary and Scientific.

THE BIBLE RECORD OF MAN'S ORIGIN.

Regarding the scriptural account of the origin of man, James R. Nichols writes in *Items of Interest* as follows: "Whether it be regarded as a legend of very early times, a story characteristic of the East, or as a supernatural revelation of man's genesis, . . . there is in the narrative certain internal evidence, which, independent of all other considerations, leads to its startling significance. The prominent incidents of the transaction so briefly presented are wonderfully in accord with possibilities; there is evidence of a wise adaptation of means to ends.

We are told without any show of hesitancy that man was made out of the "dust of the earth"; that is, he came from the same general mother or source as all organic life. If the statement were that he was formed out of the rocks or out of the trees of the garden, it would be far less significant of his true chemical constitution as made known through modern research. In the "dust of the earth" we have an expression which may be interpreted to mean the soil of the earth, which includes both the organic and inorganic constituents found in the physical organization of man. In this material we have lime, potash, soda, magnesia, iron, phosphorus, and quite all the chemical bodies essential to man's organism. In the humus of the soil we have the materials needed for the formation of living tissues, the carbon, hydrogen and nitrogen. The source from which man is stated to have been derived is seen to have been fully capable of supplying every needed element without the interposition of a miracle to summon the molecules from afar. A human narrator of such a stupendous transaction, would hardly have allowed his excited imagination to go no further than common dust for his man-material; he would have selected the clear air about him; the chemical nature of which was to him a mystery, or he would have interwoven the rainbow or the gorgeous hues of the setting sun into the noble form of man.

After the completion of the structure, a still more important act remained to be accomplished—the endowment of life. The narrator proceeds to say that "God breathed" into the figure of man the breath of life." This language and statement is even more remarkable than that relating to the formation of the body. From what we know of the mind or soul of man, we cannot give it a lower place than is assigned in the narrative; it must be "breath," or an emanation from the Creator; it must be the closest, most distinctive representation of the Supreme intelligence of all principles in the universe. It is infinitely higher than matter; it is a part of a Divine originator. If this

were only an Eastern tale, told by an ancient story-teller, he would have given life to his figure by agencies far different; the statement would be too tame to meet his own inclination or the wishes of his listeners. Whoever wrote the first chapters of the book of Genesis, it is certain he was no ordinary chronicler; he was destitute of the gorgeous imagination so common to the authors of the legends and tales of the East, and was clairvoyant in a high degree. He must have had whisperings from unseen sources, and been directed by a wisdom not common to the men of the times in which he lived. . . . What is called the Mosaic account of the Genesis of man, taken as a whole, must be regarded even by evolutionists as remarkable.

BOOK NOTICES.

MALARIA AND MALARIAL DISEASES, by George Sternberg, M.D., F.R.M.S., Maj and Surg. U. S. Army, &c., &c. New York: William Wood & Co. for July, 1884. Cloth, pp. 29. Sold only by subscription.

This, like all of Wood's series, especially this year, is a very handsome volume. This one is on an attractive subject, but it is somewhat disappointing, for, as an exchange has it, "The well-known reputation of Sternberg as an investigator of this subject led to the hope that he had some solution of the difficulties in which it is involved. With the most painstaking care he has ransacked all sources for all known facts bearing upon the solution of the problem, only to leave the tangle as great as ever." Still, the book gives an admirable history of the present knowledge on the subject, and will well repay careful reading. Relating to the nature of malaria, the author says:—"As neither the researches which have been made nor the speculations in which we have indulged have brought us to the point of answering in a definite manner the question, What is malaria?—we are reduced to the necessity of concluding this chapter with an acknowledgment of ignorance as to the real nature of this widely distributed poison.

"The question whether malarial poisoning may result from the drinking of surface water in malarious regions is one of great importance. It is well established that enteric fever and certain active fluxes may result from the use of contaminated drinking water; and in the case of the former disease we know that even very great dilution does not destroy the infectious properties of the contaminated water. That fevers having an intermittent or remittent character may also be produced in the same way cannot be doubted. But we have already seen in the introduction to the present volume that enteric fever frequently pre-

ents these characters; that in this case the differential diagnosis from malarial fever presents great difficulties; and that in many parts of the world fevers of this character are attributed, without question, to malaria. We therefore feel inclined to accept the evidence with a great deal of caution. Moreover, we think that considerable weight should be accorded to the negative evidence. It would seem that, if this mode of infection occurs at all, it should occur frequently, and in that case it should be more generally recognized. From what has been said in the introduction it will be seen that we cannot except evidence relating to the production of 'malarial diarrhoea,' or 'malarial dysentery,' or 'mountain fever,' or 'continued remittent fever,' or 'typho-malarial fever' in any of its forms." In this the SANITARY JOURNAL is fully in accord with the author.

THE FIRST NUMBER (vol. 1, No. 1) of *Annals of Surgery*, a monthly review of surgical science and practice, is on our table. From what we had learned of this proposed work we had expected a good deal, and we are not now disappointed. It is edited by L. S. Pilcher, A.M., M.D., Brooklyn, N. Y., and C. B. Keely, F.R.C.S., London, Eng., and is the only journal in the English language devoted exclusively to surgery. There is a long list of collaborators given, surgeons of eminence, in the United States, Great Britain and Canada, who will contribute to the work. It is to be published simultaneously in the United States and Great Britain. Each number will contain from 80 to 100 large octavo pages of reading matter, printed upon the finest paper, with large clear type, and every accessory necessary to make it typographically perfect. Illustrations will be freely introduced whenever required to elucidate the text. It will be such as to make its volumes especially adapted for preservation for future reference, thus making it a lasting record of contemporary surgery. United States publishers,—J. H. Chambers & Co., 405 North Third Street, St. Louis, Mo.

THE JANUARY NUMBER of the *Popular Science Monthly* contains a good article on the "Jury System," by O. H. Stephens, and one on "My Schools and Schoolmasters," by Prof. Tyndall, with others on "Agnosticism," "Studying in Germany," "State Usurpation of Parental Functions," "The Chemistry of Cookery," and a number of other interesting subjects. In a paper on "Architecture of Town-Houses," by R. W. Edis, F.S.A., we find the following:—"It is surely time that every house erected in the great centres of habitation should have some systematic supervision, so that ordinary precautions shall be insisted upon to secure proper sanitation, to

prevent the use of grossly inferior materials, and to prevent these plague-spots being formed in our midst; for it must be born in mind that every house built under the system I have condemned not only tends to the individual discomfort of the special occupier, but adds materially to the unhealthiness of a neighborhood." The editor, after referring to Mr. Harrison and the worship of "humanity," says:—"The devotees of this new religious cult may be sincere, but they are none the less absurd; and to call this result of insane egotism—the substitution of man for God as an object of worship—by the name of *religion*, is to take liberties with the meanings of words which, if carried out, would reduce all language to a state of chaos."

THE JANUARY *Century* is fully up to the usual high standard of this magazine. Among other things there are "Recent Architecture in America" and "The making of a Museum," both profusely illustrated. There is a biographical sketch of Edward Everett Hale, the author and preacher, whose "central purpose of life is to help," the "dominant cord" in whose nature is "compassion;" who says "we professional men must serve the world, not like the handicraftsmen, for a price accurately representing the work done, but as those who deal with infinite values, and confer benefits as freely and nobly as nature." There is another instructive article on "Christianity and Popular Amusements," by Washington Gladden, who tells us that "the duty of the Church with respect to popular amusements is not done when it has lifted up its warning against the abuses that grow out of them, and laid down its laws of temperance and moderation in their use. It has a positive function to fulfil in furnishing diversions that shall be attractive, and, at the same time pure and wholesome. This cannot be done, as we have seen, by the churches as churches, but it can be done by men and women into whom they breathe their spirit, and whom they fill with their intelligence and goodwill." He then explains how, in Cleveland, a successful effort was made to entertain and instruct the working classes. There are some very good things in "Topics of the Times," "Open Letters," and "Bric-a-Brac."

THE MIDWINTER (February) *Century* will contain an article by Dr. W. George Beers, of Montreal, on "Canada as a Winter Resort," profusely illustrated by Henry Sandham, with views of tobogganing, curling, racing on snowshoes, etc. The Montreal carnival will give this paper an especial timeliness. Two full-page illustrations of Mr. Howell's article on "A Florentine Mosaic," are said to be quite remarkable reproductions by the wood-engraver of etchings. Mr. Pennell, the artist, was sent to Italy

by the publishers of *The Century* to illustrate Mr. Howell's series on Italian cities, of which this is the first paper.

HARPER'S BAZAR AND HARPER'S WEEKLY, in the early numbers of this year, keep up, indeed rather exceed, the usual high standard of these popular weeklies. The first issue of the *Bazar* for the year is an admirable number, the illustrations, especially "A Christmas Story," "The Morning Prayer" and "Santa Claus," being unexceptionably good. Juliet Corson is writing in the *Bazar* good articles relating to health. In referring to the longevity of the Jews, she writes, "a recent Jewish writer asserts that the remarkable survival of the race, despite the persecution of centuries, is a clear instance of the survival of the physically fittest, the natural sequence of a religion which considers the present and material welfare of its followers, and which attaches as much importance to the care of the body as to the condition of the soul. . . . Even less than two hundred years ago so little was the sanitary necessity of habitual cleanliness understood that when Priessnitz announced his water-cure he was hailed as the discoverer of a new factor in medical treatment."

ST. NICHOLAS "for young people"—and many who are not young are greatly pleased in reading it, is really a charming serial. In the December and January numbers every page is full of most interesting things. In the February number we are promised, amongst other good things, a frontispiece, "Beggar Boys at Play," after the celebrated painting by Murillo; "Driven Back to Eden," with five illustrations; "No Longer a Baby"; "Davy and the Goblin"; "My Valentine," verses, illustrated; "A Garden of Girls"; "English Kings in a Nut-shell"; "Little Red-Riding-Hood and the February Wolf"; "A Queer Partnership"; "Ralph's Winter Carnival"; "The Brownies' Return," illustrated; "Stories of Art and Artists"; "For Very Little Folk" and "Jack-in-the-Pulpit." The great feature which makes St. Nicholas so attractive is its entire, and, if we might here use such an expression, "far-fetched," originality.

THE "WEEK" asserts that it enters on its second year with a most encouraging prospect for the years to come. Its early difficulties have been surmounted; it is now firmly established; its circulation fully answers the expectation of its proprietors, and is steadily increasing. The union which it presents of the magazine with the weekly journal appears to be recognized as the thing needed; and independent journalism is evidently growing in favour with the most enlightened and patriotic portion of the community, as it certainly should. The *Week* stands high in the estimation of foreign journals as well as with

the Canadian press on both sides of politics. Its weekly criticisms of current events and opinions, from one of the ablest of modern writers, is its greatest feature; while its "Topics of the Week" and its departments of education, science, art, music, and sometimes health, make it a welcome, and indeed an almost indispensable visitor.

IN "GRIP" of the 10th inst. is a good cartoon representing "Typhoid Bay," Toronto, with vapors of "infection" flowing upwards from the mouths of the sewers, which empty their accumulated filth into what once was a beautiful basin of water. There is a representation of an old pump labelled "foul water," and of the recently elected mayor, in working costume, with broom in hand, with Mr. Grip standing near saying, "now then, my lad, bustle around and get to work. You've no time to lose." In explanation, *Grip* writes, "What we want is good city government, whether Grit or Tory. Give us John A. and good city water. Let us have the N. P., and a good drainage system. Finish the C. P. R. next year and clean up the back yards."

THE MONTREAL DAILY STAR, we learn, is bringing out a magnificent Carnival number, something that will eclipse in artistic merit and absorbing interest every illustrated paper heretofore issued in this country. It will have the attack on the ice palace and defence by the Garrison in all its magnificent pomp and brilliancy; the tobogganing fête in its true natural beauty; the ice Condora after the Egyptian models, inaugurated with electric and pyrotechnic illuminations; the mammoth ice-lion (British); the great sleigh drive, embracing thousands of superb equipments, and probably the grandest thing of the kind of modern times; the fancy dress entertainments, true to nature; and a magnificent inset-plate of the ice palace—a fine picture for framing. There was a great *furor* over the last year's Carnival number of the *Star*, the issue running up to nearly a quarter of a million. It is said this year's number will be far ahead of that. The artists are Bengough, Julian, Harris and Haber. The writers, George Murray, John Reade, Dr. Beers, "A Iron-lad" Murray and W. H. Turner. *Grip* sends for publication in the Carnival *Star* a double page which is said to be the most side-splitting cartoon ever published in this country. The Carnival number, too, will be published at the low price of fifteen cents, by Messrs. Graham & Co., Montreal.

PROBLEMS OF NATURE is a new aspirant for public favor, published semi-monthly, in New York, and edited by H. B. Philbrook. It is a scientific paper, and advances many new theories, as, for example, on the "Origin of Species," the "Effects of Electricity in the Earth" and in the "Growth of Plants," and "The Phenomena of Vaccination," which are as striking in their boldness and the confidence with which they are put

forward, as in their complete originality. For the most part, the paper affords highly interesting reading and food for reflection. The following will show the view of the editor in relation to a future state:—"The body is created for no purpose but to become a mould in which to cast a soul. It is a mere mould for such a casting, and it is destroyed as soon as the casting is completed. In all the conditions of life there is merely a common understanding that our lives are in some way necessary for the preparation of a life beyond the death that awaits all."

FoRMIC ACID is recommended as the most rapid destroyer of bacteria.

SHEEP'S HORN is used in Lyons for making horse shoes which will retard slipping on smooth pavements.

A **FRENCH BALLOON**, reported to have travelled several miles in a pre-determined course against the wind, has failed on a second trial.

A **RUSSIAN AERONAUT** is constructing a cigar shaped balloon which is to carry sails, hold a steam engine, a crew of 16 men and a large amount of ballast.

LUMINOUS key hole trimmings and door knobs are said to be in great favor with bibulous minded persons, and convenient for others. They are made of glass, covered with luminous paint, and may be seen on the darkest nights.

BYCICLE CAPABILITIES may be considered as amongst the wonders of the age. The distance between London and Edinburgh, 400 miles, has been covered in two days and nine hours, considerably more than half the distance being travelled in the first twenty-four hours.

MISCELLANEOUS ITEMS.

A **PSYCHOLOGICAL SOCIETY** is to be organized in Montreal. Will not some one move for one in Toronto?

CHATHAM, Ont., is agitating the subject of a water-supply.

An international health exhibition is proposed for New York city.

The health officer of St. Paul intends to prosecute for neglect in the proper construction and location of cesspools.

The sanitary department of Memphis spent last year \$39,681.72. The Memphisians believe theirs is the cleanest city in the world.

In Boston, an association has been formed with a capital stock of \$250,000, in shares of \$100, to provide homes for the working population of that city.

SIR MOSES MONTEFIORE, at the age of one hundred, has recovered from a severe attack of pneumonia.

Miss Ford, a young teacher in Massachusetts, recently marshalled three hundred and fifty children in the school building, that was already a sheet of flame, with such order and discipline that every child was saved.

A **CASE** of scarlet fever in a canary is reported (*Brit. Med. Jour.*). The bird was in a room where two children lay sick with the disease. Its skin became bright scarlet, its throat apparently sore, and it finally died.

A **CHILD** recently died in St. Louis, Mo., from narcotism, superinduced by doses of Bull's cough syrup.

A **LADIES' Protective Health Association** has been organized and will be incorporated in New York city.

SAGINAW, Mich., a city of 30,000 inhabitants, has fourteen and a half miles of sewers.

THE Glasgow sanitary protection association has 206 members.

FALSE ECONOMY.—Horace Mann says: "Seeing that the atmosphere is forty miles deep all around the globe, it is a useless piece of economy to breathe it more than once."

ST. LOUIS, Mo., has 7,000 wells and an effort is being made to have them filled up where hydrant water can easily be obtained. At a special meeting of the medico-surgical society of that city it was voted that all wells and vaults in the city should be closed at the earliest possible moment, in view of the probable appearance of cholera in the spring.

A **CONFERENCE** of local boards of health in Minnesota will be held in St. Paul during this winter.

THE OUTBREAK of the peculiar and fatal disease in Virginia and Kentucky, according to the *Philadelphia Medical Times* is attributed to a prolonged drought, which has made the water supply low, the streams being more than usually charged with mineral and vegetable substances.

OF THE SMALL-POX in Hungerford, the medical health officer of that municipality reports that there were 205 cases of small-pox in the township during the recent epidemic. Of these 46 proved fatal. There had been probably 12 deaths from the disease in other townships.

M. PASTEUR anticipates (*Scientific American*) that bisulphide of carbon will become the most efficacious of all antiseptics, as it is also the cheapest, costing but a fraction of a penny per pound in large quantity. It is also the best insecticide known, and for this purpose may perhaps be useful to preserve woodwork in tropical countries. As first produced it is very foul smelling but it is capable of purification till all offensive odor is removed, and is sufficiently pure almost to mix with a perfume. It will probably also prove a cheap and valuable disinfectant for disinfecting rooms in which patients have suffered from contagious diseases. Indeed it is recommended by Pasteur and others for this purpose and as the least injurious to the furniture, or articles of metal in the room.