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VOL. II. MARCH, 1876. No. 3.

THE SANITARY JOURNAL.

DEVOTED TO

Public Health and Preventive Medicine.

EDITED BY

EDWARD PLAYTER, M.D.

SALUS POPULI SUPREMA EST LEX.

CONTENTS.

PUBLISHED MONTHLY,

TERMS. TWO DOLLARS PER ANNUM IN ADVANCE,

Two Copies, 1 Year, $3.50; Three Copies, 1 Year, $5.00.

Single Copy, Twenty Cents.

DUDLEY & BURNS, PRINTERS, NO. 11 COLBORNE STREET.

THE

SANITARY JOURNAL.

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PUBLIC HEALTH.

VOL. II.] MARCH, 1876. [No. 3.

Original Communications.

A DESCRIPTION OF THE PESTILENT CONDITION OF THE TORONTO LUNATIC ASYLUM IN 1853, AND THE MEANS ADOPTED TO REMOVE IT.

BY JOSEPH WORKMAN, M.D., LATE MEDICAL SUPERINTENDENT.

(Continued from our last.)

Purity of the water we drink is but second in importance to the purity of the air we breathe. No large public institution should ever be placed on a site which does not command a never-failing, abundant, and cheap supply of this essential requirement; and yet some most astounding blunders, in this very relation, have been made in all countries, and very recently within this Province, by men who might have been expected to possess some measure of common sense. Take, for example, the locating of the London insane asylum some two miles from the river Thames, and the Hamilton asylum on the top of the mountain, three or four hundred feet above the surface of Lake Ontario! The former has ever since its opening, been shambling on under short allowance, and our sagacious minister of works has been forced to try the experiment of boring for an artesian spring, under what geological prognostics I am unable to conjecture, but as the borers are now down some twenty-four hundred feet, and the cost is only some five or six dollars per foot, we may hope to have good tidings some time between this and the millenium. If, however, the result of this costly bore prove no better than did that of a similar one at the St. Louis Asylum, or if the

water finally tapped turn out of no better quality than that which flows from another bore in London, on the edge of the river behind the court-house, we shall have a second edition of the Car-Company's success.

As to the Hamilton Asylum supply of water, it will be of good quality and will require *only three pumpings* to reach the top of the building; but men of ordinary foresight would have supposed it would have been better and cheaper, to have built the asylum some place nearer Lake Ontario, where the water might have been obtainable at a much easier lift, and at much less cost. Be it observed too that the very same difficulty will have to be encountered in the delivery from the city of every article of household supply.

Another very serious evil in the ill-chosen sites of both the London and the Hamilton Asylums, is the impossibility of carrying off the sewage to any available and innocuous outflow. Already the residents and property owners in the vicinity of the London Asylum are taking legal steps to compel the Government to free them from the nuisance discharged through their grounds. A very short time will elapse before the like complication will be met with at Hamilton. Doubtless, however, we shall be regaled with some very sage suggestions as to the deodorising and utilizing, for agricultural purposes, of the sewage of these two establishments. If the success prove no better than it has done at some places in the Old Country, the experiment had better be left untried. In the direction of any large institution, just as in the government of any large town, *sanitary* considerations ought to be paramount to all others. Get away, therefore, as fast and as far as possible, with everything that may prove detrimental to health; no amount of benefit to the land or crops of an asylum or hospital farm, can compensate for the injury done to the health of the inmates by the breathing of air charged with the gaseous emanations of excrementitious reservoirs, situated within any moderate distance.

The Toronto Asylum was, (by mere accident,) located, so far as related to abundant and cheap water supply, and to facility of discharge of its sewage, in a very good position; but a most shameful, or indeed, as I might well say, murderous blunder was made in the selection of the place of discharge of the latter. It may appear to your intelligent readers incredible, yet it was the horrible fact, that the main sewer from the asylum, carrying off all the foul fluids and excrementious matter from 450 human beings, and a large number of cattle, emptied its contents into the lake within 100 feet of the point

from which the water for supply of the institution was furnished. This evil might have continued for an indefinite period, had not Providence sent relief in the cutting of the Great Western and Grand Trunk Railways through the Garrison Common. It became necessary to lower the sewer under the tracks, and thus its contents no longer found outlet at the pumping-house, but ran down the side of the Grand Trunk and escaped over the beach into the lake, three or four hundred feet from its previous entrance.

The salutary change was instantly observable. Before, water at times actually stank, and some persons with keen sight declared that they could see feculent particles floating in it. In calm weather, when the lake was motionless, the foul fluids emptied from the sewer would unquestionably make their way over the short distance between the mouth of the sewer and the mouth of the supply pipe, conducting the water into the pumping-house well. By this arrangement it is quite probable that befouled water leaving the house in the morning, found its way back again, in a rather improved form, before night. Here was another beautiful illustration of the value of a building committee.

Do not the citizens of Toronto well know that the water supplied to them for years past, has been just such as that pumped up to the Asylum before the year 1855? Or rather must it not have been very much worse? All the sewage of the city is discharged into the bay, and though now we have promise of a pure supply from beyond the island, must not the accumulation of filth, which is constantly and rapidly going on all along the water front, soon become a vast pestilence concoctor and disseminator? Our city authorities cannot enter upon the serious consideration of this matter a day too soon. The poisonous water of our sewers must be carried away a sufficient distance, whether eastward or westward, to prevent deposit of pestilent matter in any part of the bay. It is my opinion that the cheapest and best plan would be the construction of a large trunk sewer along the front, running westward through the garrison common, and onward into the Humber Bay, so that the efflux of the river would there carry the foul discharge out into the lake. As the surface level of the lake is uniform, it is a matter of indifference, unless as to distance, in which direction the trunk sewer is conducted. If an eastward course be the shorter, it must be preferable: but considering the obstacle presented by the Don, over which the sewer must be carried, (for to empty its contents there would be but to perpetuate the nuisance), and the proximity of the

marsh, the outlet would be more distant than that at the Humber Bay, consequently the grade of the sewer bottom would have less desent, which is a matter of great importance.

It may be objected to the western course, that the discharge of the sewage into the Humber Bay, would pollute the water outside the island, and thus, in at least a mitigated degree, reinstate the evil sought to be removed. I do not, however, apprehend this occurrence,

The prize report of Sandford Fleming, published in the *Canadian Journal* of 1854, shows that nearly all the rivers discharging into our lakes have bars thrown up in front of their entrances, by which they are deflected from their prior direction, and turn sideways along the coast. The direction of these bars is in a line determined by the conflict between the strongest opposing lake drivings, and the force of the discharging stream; and as all our storms of longest wave fetch, on the north shore of Lake Ontario, come from the eastward, the bars formed tend westward. I am not acquainted with the hydrography of the Humber Bay, but I should expect it to have a bar in front of the river mouth, similar to those at the mouths of other rivers: and if so the direction taken by the entering stream will be westward, and thus any foul water discharged here would be carried so far out into the lake as, in all probability, to keep clear of the south side of the island, or certainly to be so diluted and purified as to be perfectly harmless.

One or two writers in our newspapers have expatiated rather vehemently on the pestiferous emanations escaping from the street sewers, which they believe to be immense cess-pools of detained excrement. I do not believe that any such accumulations exist in any of our sewers in which a uniform and carefully directed grade has been constructed. The asylum main sewer is an oval of 2 feet wide by 3 feet deep. The distance it runs to the lake is nearly a mile. The fall to the lake is not very great, but the whole is equally distributed, consequently the descent is uniform. I have seen this sewer opened at many points, and I never observed the slightest detention anywhere, of the fluids or solids in it.

The most extensive gaseous emanations from our sewers take place when they are perhaps least noted; that is to say, on the occurrence of heavy rain, or thunder storms, and in rapid spring thaws. At these times a large body of water is suddenly thrown into the sewers, and of course it displaces a corresponding volume of foul air. The water does not drive

the air before it, down-hill; air always objects to this course of escape. It rises upward through every available outlet, much of it at the street-corner gratings; much up through down pipes of house eaves; and a little (which indeed is too much), through untrapped cellar and basement drains. The strong north west winds which follow all our heavy rain storms, speedily dissipate and carry away the escaped foul air.

Before closing this communication I would beg to offer a few remarks on the subject of dry earth closets. These conveniences under certain exigencies are very valuable. For instance, in private houses unprovided with properly constructed water-closets; in cases of sickness, in which the intestinal discharges are very offensive, or any danger of contagion is present. Under other conditions they are both useless and highly objectionable. They are utterly unsuited to large institutions.

In every instance, known to me, where they have been introduced into insane asylums in England, they have been discarded as insufferable nuisances. At the instance of the Board of Asylum Inspectors, I made trial of one, but was not very long in coming to the conclusion that its absence would not be an evil. A quart or two of cold water poured into a common chamber vessel, immediately before using, provided it is carried out of the sick room, and properly disposed of immediately, will generally be found to be an adequate preventive of disagreeable odour, and of infection. When, however, earth, or any substitute, such as wood-ashes, is used, care should be taken that it is thoroughly dry, and that a portion shall be put in the stool vessel, both before and after using; and above all things see that the evacuations are instantly carried away.

MILK—THE TORONTO SUPPLY.

The Chairman of the Board of Health:—

SIR,—The subject of adulteration of cows' milk, and the various kinds of impurities which affect this all-important article of diet, has received the attention of the City Council; and a measure thereupon has been referred to the committee of which you are chairman. There has also been some correspondence in the Press respecting the matter, in which a member of the City Council, Mr. Hallam, who has evidently given some attention to the question, has invited "any gentleman to give information on this important subject to the Board of

Health." It is in consequence of this request that I have regarded it my duty to present to the Board some facts which have come within my personal knowledge.

In speaking of adulteration of milk it is desirable to have a distinct meaning implied or conveyed by the term. I should prefer to use the term *impure* as more correctly and fully embracing the several causes of deterioration of this article of food. Milk may be diluted without being really adulterated. If the water used to dilute is pure the milk is simply diluted, not adulterated.

The causes of impurity or deterioration of milk may be embraced under three heads. (1) Anything which affects the health of the animal; (2) Dilution by pure and impure water; (3) Adulteration by the use of chemical or other agents to preserve the appearance and taste of the fluid after dilution. To dilute milk for sale is a fraud; to adulterate it is a worse offence; and to employ agents for adulteration detrimental to health is a flagrant crime.

Some time ago, having obtained from the accommodating City Commissioner a list of the cattle byres in the city, I proceeded to visit a number of them; and it is the result of observation at that time, and the knowledge otherwise acquired which I wish to place before the Board of Health.

Referring again to the three classes of causes of impure milk, I think the first, at least in Toronto, is the most important, because the most common and productive of harm. Dilution of milk is no doubt too frequently practiced; but so long as the water is pure the milk is not vitiated. However, there is reason to fear that the water is often impure. Organic matter suspended in the water may not only itself be deleterious, but it may effect a change more or less injurious in the constituents of the milk. With regard to the class of causes where there is really adulteration, I think there is insufficient reason to believe that it is practiced to any great extent in Toronto. But, when it is employed the adulterants may be innoxious or the reverse. Adulterated milk is especially hurtful when it constitutes the food of children or sick persons. I think, however, that it may be stated that the greatest cause of impure milk is to be found in connection with the feeding and housing of the animals.

As far as I have been able to learn, the dairymen of the city, having disposed of the cows in the spring, which are usually then in a good condition for the butcher, buy, about the 1st of June, a fresh stock, which are placed in fields in the suburbs or within a few miles of the city, for the summer. The cows

consequently live upon wholesome food during the summer in the open air. About the 1st of October the animals are brought into the city and at once put into the stables or byres. These byres I found to differ considerably as to size and convenience, and comfort and cleanliness; but in some respects they all have features in common. It is an important fact to remember that in the treatment of the cows during the winter months there is the intention to have them fatted for the spring, or before. If I mistake not much of the profit arises from this disposal of the stock for beef. To further the process of fatting the creatures are confined in a dark place, with little or no ventilation. The vapour arising from the bodies of the animals and the excreta, fills the byres, so that upon opening the door the steam rushes out like from a steam boiler. One unaccustomed to it can at first breathe within with difficulty. Now, the unfortunate cows after living in the fields, are tied up in the byres in a narrow stall, with barely room to lie down, with no bedding. And here they remain from the time they enter until taken out to the slaughter-house. I suppose the poor brutes after a while become accustomed to it; but for a while they must suffer very much. In many cases they seemed to be breathing laboriously; and in one instance I remember the panting of all in the byre was truly painful to witness. I believe the argument the dairymen employ is that inasmuch as the animals grow fat they must be comfortably off; but the fallacy of this statement needs hardly to be mentioned. The milk furnished by the cows under such circumstances cannot be healthy. For some time the feverish state of the animals' system must vitiate the milk; and, subsequently, the want of pure air, and that sluggish state of the organs of the body favourable to fatting must also cause a deteriorated state of the milk.

The length of this communication already, will not permit me to speak at length of the character of the food for the cows during the winter. In most cases I found that proper food formed part of the cows' nourishment, but with one exception still-slops was also used, and the only fluid given them was in this form. That still-slops possess the properties of food to some extent is doubtless true, but it is not good food, especially for animals confined as they are in these byres. Milk formed from still-slops, with the cow in a close dark stable cannot be pure.

There are other points upon which I might dwell, such as the danger of filth in the milking of the cows in a dark stable. They are frequently plastered with manure about the udders,

and it is, I should think, almost impossible to draw the milk without its becoming contaminated. There is also reason to fear that the animals suffer from various diseases, and that ulcers frequently exist about the teats.

Some of the byres are in a most disgraceful state of filth, and not only is the milk thereby necessarily made impure and unfit for human food, but they constitute a nuisance to the neighbourhood, and a source of pest to the city. The City Commissioner has wrought a wonderful reform; but the law is inadequate to enable him to accomplish what is requisite for the health of the public.

Although much might be said upon the subject, I feel I have exceeded reasonable limits in addressing you. But I trust the importance of the matter renders an apology unnecessary.

Respectfully yours,
WM. CANNIFF, M.D.,
M. R. C. S., ENG.

301 CHURCH ST., 17th FEB., 1876.

PRACTICAL NOTES AND EXTRACTS ON HYGIENE.

(Continued.)

VENTILATION—MOVEMENT, DIFFUSION, &C., OF AIR.

In the February number of the SANITARY JOURNAL it was said that the movement of air arising from difference in temperature, and consequently in weight, of the air inside and outside a room is chiefly to be relied upon in *natural* ventilation; and a table was given showing the amount of air in cubic feet which would enter a room each minute through a sectional area of one square foot (one fourth being deducted for friction) for all probable variations in temperature between internal and external air, and probable height of columns of air, *i.e.*, the distance between the lower part of the column (as the floor of the room) and the point of delivery into the open air (as the top of the chimney or ventilating tube, or the outlet of the room where this communicates directly with the outer air.)

It must be remembered however, that the movement is influenced by the wind. It may appear superfluous to many readers of the JOURNAL to go back, as it were, and add here that, when a certain amount of air is warmed it increase in volume, becomes lighter, bulk for bulk, and immediately com-

mences to rise, while cooler air flows in to take its place. The air therefore contained in a room on being warmed, expands, and a portion of it escapes through certain of the openings and crevices about the windows and doors, if there is no special outlet, while the colder, outside air forces its way through other apertures to establish an equilibrium. Thus a steady stream of fresh air may be made to flow into a room by sim ply providing openings and maintaining the inside temperature higher than that outside.

In these circumstances, this movement is constant, and when not interfered with by wind, is regular and equable. Of it Parke's says: "It will alone suffice to ventilate all rooms in which the air is hotter than the external air. As its action is equable, imperceptible, and continuous, it is the most useful agency in natural ventilation in cold climates, in inhabited and warm rooms; and in all habitations, arrangements should be made to allow it to act. As the action increases with the difference of temperature, it is most powerful in winter, when rooms are artificially warmed, and is least so, or is quite arrested in summer, or in hot climates, when the internal and external temperatures are identical."

*"*Perflation* is best exemplified in the cross-ventilation which takes place through opposite windows when opened. This is by far the readiest means which can be adopted for removing speedily and effectually ærial impurities from a room, but it cannot always be depended on, on account of the uncertainty of the rate of movement; for if the air be stagnant, there can be little or no perflation, while, on the other hand, if the rapidity of movement is great, perflation becomes insupportable in consequence of the draughts produced. A current of cold air moving at the rate of five or six feet per second becomes unbearable. In spite of this objection, however, cross-ventilation should always be provided for whenever it is practicable, and especially in large rooms, such as hospital wards.

"The aspirating-action of the wind produces up-currents through chimneys and air-s' afts, by creating a partial vacuum in them, which is constantly being filled by the column of air from beneath. The mechanical arrangements which have been proposed or adopted to facilitate the action of the natural ventilating powers are so numerous and varied, that only a brief mention of the more important of them can be given. To utilise the perflating force of the wind, opposite windows should be made to open from the top and bottom, and to

*Extract from "Hand-Book of Hygiene," by George Wilson, M.A., M.D. C.M., &c. &c.

obviate the unpleasantness arising from draughts, some such arrangements as the following have been recommended:—

"(1.) By having the window so constructed that the top slopes inward when it is opened, so that the entering current of air impinges against the ceiling. If the window is large, as in churches or schools, only a section of the upper part may be made to open in this way. (2.) By substituting a glass louvre for the top centre pane. (3.) By having some of the panes doubled; the outer with an open space at the lower edges; the inner with an open space of the same size at their upper edges. The air on entering is thus made to pass upwards between the panes.

One of the best inlets is the Sheringham valve, which closes at will by a balanced weight. It slopes inwards and upwards when open, so that the entering current of air, which first passes through a perforated brick or grating, is directed towards the ceiling.

In some cases cross-ventilation can be tolerably well maintained, independently of opposite windows, by means of transverse ventilating boxes or tubes, situated at regular distance, and in close proximity to the ceiling. These boxes or tubes extend from wall to wall, and communicate with the external air at either end by air bricks. The sides are made of perforated zinc, and there is a diaphragm in the centre of each to prevent the wind from blowing right through. According to the direction of the wind, one-half the tube becomes an inlet for fresh air, which falls gently into the room through the perforated zinc, while the other half becomes an outlet for the vitiated air. This plan does very well for large hospital wards having an internal corridor running along one side. Inner rooms can also be supplied with a certain amount of cross ventilation in the same way.

"The *aspirating* power of the wind is best utilised by placing cowls on the tops of air-flues or chimneys. They should be made to rotate according to the direction of the wind by means of vanes, and in order to prevent the entrance of rain, their upper margin should always project to some extent. . . . All cowls have to be well balanced, and so adjusted that they can rotate readily, without becoming fixed. Louvres are sometimes used instead of cowls, but unless specially constructed, they are apt to let in the rain, and permit down-draughts.

"A system of natural ventilation, well suited for large rooms, and which has been highly spoken of by Mr. Robson, architect to the London School Board, is that devised by Mr.

Potts. It consists of a hollow metal cornice running continuously round the room, and divided longitudinally throughout its whole length into two separate channels, by a plate attached to the lower one. The fresh air is admitted through openings in the wall into the lower channel, and falls imperceptibly into the room through numerous perforations. The upper channel communicates either with the smoke-flue or other air shaft, and receives the vitiated air through a series of small openings similar to those of the lower channel. As the fresh air being colder descends by its own gravity, and the vitiated air being warmer rises to the highest point, there is no doubt that the principles of the system are correct. Mr. Robson strongly recommends it for facility of application to buildings originally erected without proper provision for ventilation, for sightliness, economy of first cost, and self-acting properties.

"The plan proposed by Mr. M'Kinnell, though it belongs to the same category, is less widely applicable than either of these two, because it is only suited for one-storeyed buildings or upper rooms. It consists of two hollow cylinders, one within the other, and of such relative calibre that the transverse area between the tubes is equal to the sectional area of the inner tube. The inner tube is of higher elevation than the outer, and acts as the outlet. The fresh air enters between the tubes, and is thrown up towards the ceiling by means of a horizontal flange surrounding the lower margin of the inner tube. Both tubes should be situated in the centre of the ceiling or roof.

"For ventilating workshops or factories, a plan has been advocated by Dr. Stallard, which appears to possess some special merits beyond those of mere novelty. He proposes that the ceiling of every workshop should be formed of zinc or oiled paper pierced by numerous small holes. Above this perforated ceiling, and between it and the roof, or between it and the next floor above, there should be a free space or air-chamber open to the atmosphere on all sides. This plan while it would not interfere with ventilation by open windows nor with ordinary methods of warming, would give free play to the different modes of natural ventilation, and is intended to supply, as nearly as possible, the conditions of living in the open air, summer and winter, without exposure to extremes of weather.

"Another plan, which has been found to work well in schools, has been proposed by Mr. H. Varley. A perforated zinc tube, communicating with the external air, passes round

the cornice of three sides of the room, while on the fourth side another perforated tube is connected with the chimney, which acts as the extraction-shaft."

If in this plan of Mr. Varley's the tube on two sides of the room, instead of on one, communicated with the extraction-shaft, and acted as outlet, it would seemingly answer a better purpose.

The Tobin system, which has recently been fully discussed in both medical and lay journals, belongs also to the same category as the above, and is intended to facilitate the action of the natural powers, to diffuse the air and prevent draughts. In it, perpendicular tubes extend from the floor 5 or 6 feet into the room. The air enters below, and is, as it were, concentrated into a current, which is continued above the tubes to the ceiling, striking which, it is distributed into the room. These tubes may be ornamented; and Dr. Stevenson, as noticed in the February number of the SANITARY JOURNAL, has adopted an improvement on this plan, that of lining the tubes with flannel, by which the air is filtered and the sound deadened. He says he has tried this in his own drawing room, and it works admirably.

(To be Continued.)

HYGIENIC EFFECTS OF THE WARM BATH.

[Extract from a Treaty on Baths, by John Bell, M.D.]

A knowledge of the physiological action of the warm bath enables us to appreciate the better its hygienic effects. The very exercise of the function of each organ, although necessary for its health, is accompanied with or implies the existence of an excitement which is itself a means of wearing out and exhausting the energies, strength we may call it, of the organism. The more, therefore, we can restrain the range and force of this excitement, short of interfering with that which is necessary for the functional exercise of the organs, the more do we husband the strength and prepare the general system for a renewal of exertions, and especially of those of the brain and muscles, in the processes of thought and locomotion. The most efficient means of procuring this desirable result are sleep and a recumbent posture. The warm bath implies the second of these as a matter of course; and it makes the nearest approach to sleep, if it does not actually procure it. In it the nervous and muscular systems enjoy repose and the

refreshment following repose. The internal organs, and especially that great and ever-active hollow muscle the heart, and the muscles concerned in respiration, though not obtaining entire rest like the voluntary ones, or those of locomotion, are as little tasked as possible in the bath; and thus the general system is saved a great expenditure of excitement, and is prepared for subsequent renewed, and, if need be, violent exercise.

The more complete the repose or the approach to the lowest degree of excitement compatible with health, the greater will be the renovation of all the functions, and their ability to endure subsequent exertion and fatigue. Modern civilization, with its unceasing restlessness and fidgetiness, seems to have forgotten this wholesome principle of hygiene: it acts as if change of sensation, a continual lashing of the flagging faculties, by every variety of stimulus, diffusible and sensual, were the means of warding off and of removing fatigue when it does occur.

The dress and conventional postures of refined life are constrained and artificial, and are opposed to the easy play of respiration, and to the moderate action of the heart. The wild Indian and the wandering Arab of the desert, yielding to their instinct, which is but a modification of that of self-preservation, throw themselves prone on the ground, after the labour of the chase, or the day's journey through the desert is over—and even before they are overtaken by sleep: or if particular circumstances should prohibit this indulgence, they obtain refreshment from their fatigue by their very posture, which allows of the greatest rest to all the voluntary muscles, while, at the same time, it diminishes by many beats the contraction of the heart.

Even where civilization, so far at least as a formal ceremonial is concerned, becomes engrafted on the nomade life, we find all the ancient people of the East, and those who, from similarity in climate readily imbibed their practices, choose the recumbent or semi-recumbent posture, not only when alone but in their visits and festive meetings. Do we not see in their greetings of each other, and in their gestures of respect and devotion to their seniors and superiors, from the first graceful flexion of the head on the chest and folding of the arms, to kneeling and entire prostration, modifications of the same primary instinct—to cause as little strain as possible on the motor organs?

So far from admitting this instinct, which belongs to and is manifested by all animated beings, we who boast of our civili-

zation stigmatize indulgence in it as indolence and effeminacy, and as opposed alike to the acquisition of strength and to its vigorous exhibition. The Indian is not less prepared to engage afresh in hunting the buffalo, or in the pursuit of an enemy, after he has reclined for a period under the shade of a spreading tree, or on the skins in his wigwam—nor is the Tartar messenger less ready to renew his astonishing pedestrian feats, after his having stretched himself out for some hours on a divan or a pile of mattings and cushions, than if both of these persons had kept themselves stiff and erect on a strait-backed chair, or in training by a walk, or continued alternations of sitting and standing—in imitation of their more civilized instructors.

We have, it seems to me, both direct proof and the support of all the analogies of hygiene, in favour of a belief, that the entire repose of some organs and the diminished excitement of others, and the removal of irritation from all, as procured by warm bathing, are not only highly grateful to the feelings, but a powerful means of refreshment and invigoration. * *

Another cause is the diminished action and rest of the brain. In evidence of the warm bath exerting that pleasurable influence over the nervous system, on which its effects in a great measure depend, I have mentioned its tendency to produce sleep—a state alike removed from either class of sensations, the excitingly pleasurable or the excitingly painful; and a state which may be brought on by gentle friction with a smooth and soft body, such as the hand, over the skin—the same surface on which the warm bath exerts its primary and chief influence. But it is not necessary to take sleep as the representative and final effect of the beneficial operation of the warm bath. Its soothing influence is clearly enough evinced in the pleasant rest enjoyed by the senses, the brain, and the muscular apparatus for voluntary movement, and in the diminished excitement, harmonized action, and balance of the internal or nutritive organs. If, in fine, to the warm bath be added the oriental accessory of gentle friction of the skin, the person subjected to these processes will more than realize all the boasted effects of animal magnetism.

Exerting such a marked influence over the entire nervous system, including the internal and external senses and the brain, and over the circulation and respiration—we cannot be surprised at the eulogies which have been lavished on the warm bath; nor find any difficulty in understanding how it should exert indirectly invigorating effects. A person, for example, after labour or a long journey in a hot day, suffers from

feelings of heat, thirst, accelerated circulation, and excited senses, all of which are removed or allayed by warm bathing. The irritable and excited senses and brain are soothed, as well by the abstraction of the superfluous caloric as by the direct influence of the bath on the sentient portion of the skin. Hence, while strictly admitting the counter-stimulant, or sedative and tranquilizing action of the warm bath, we can understand how it should give feelings of renewed strength, by removing and quieting irritation and morbid excitement, which are, as we see in fever, inflammation, &c., so enfeebling and exhausting to the human frame.

By most persons, including even our professed teachers, a belief seems to be entertained that tone or tonic effect implies the addition of a new and active principle to the existing textures and organs of the living body. Whereas, in fact, a tonic merely acts by placing the functions in such a rhythmical condition as that the nutrition shall be more readily and completely performed; and that all the organs, in consequence, shall receive their full supply of duly elaborated blood. Another evidence of tonic effect will be a greater readiness of innervation, by which the senses are more quickly called into exercise, and the locomotive muscles into active contraction. Warm bathing complies with these requirements, and, in virtue of its sedative or contra-stimulant operation, procures tonic effects. If asked for proofs of this assertion, we point to the uniform tradition of Grecian mythology, to the uniform practice of entire nations, Asiatic and European, some of whom have been celebrated for their bodily strength and prowess in the field of battle; and, in fine, to the uniform testimony of all travellers.

ARE THE DISEASES OF CHILDHOOD AVOIDABLE?

BY C. E. SAUNDERS, M.D.,

Medical Officer of Health for Herts and Middlesex, England.

Much as has been said and written on the prevention of infectious disease, a most important point seems to have escaped general observation; it is, namely, the belief which obtains that infectious disease, at least, let us say, measles, scarlatina, and whooping-cough, belong to childhood.

No one would accuse the learned medical officer of the Privy Council of holding such a view, yet so familiar has the idea become, that we find him referring in his last report, to

measles, scarlatina, and whooping-cough as the diseases of ordinary childhood. That such they have been we readily admit, but that such they need be, we entirely deny.

At present it is an almost universal belief among the laity, and even the profession lend at least some sanction to the notion, that as a child is bound to have the diseases we have named, the sooner he gets them, and has done with them, the better; it is a kind of relief to the maternal mind to know that just as baby has got over 'vaccination,' or has cut his last tooth, so his elder brother has 'got over the measles.'

One of the gravest objections to inoculation of small-pox was that it kept the disease constantly active, and until the fatal tradition is broken down that measles, etc., belong to childhood, so long will care be wanting on the part of parents to screen their children from infection—so long will our efforts to stamp out these diseases be unavailing.

It may be argued that there is a special difficulty in protecting children from the infection of scarlatina, their age acting almost as a predisposing cause, but this we contend is by no means proved, for the fact of children suffering in greater numbers, may be because they are brought in contact with a greater number of children than of adults, and, as we affirm, the great number of attacked is due to the disease being kept active by children communicating the disease to children, by reason of the most ordinary care being wanting.

When an adult is suffering from measles or scarlatina, means are taken, and with fair success, to prevent his communicating the disease to other adults, although there may be even less need in their case, as they are possibly protected by having had the disease in early life; but with children living within the range of infection, the plan is very different; too often no care is taken to prevent their taking the disease, even if they are not purposely exposed to its influence in the hope that they may take it, and so a further stage in their life history be passed, the possibility of a fatal result being altogether forgotten. Fond mothers would be horrified if they could be brought to realise the wrong they are doing to their own children and the community at large by not taking every precaution to avoid infection, and to learn that by just so many as there are children attacked, are the number of sources multiplied from which infection spreads to others.

The power which section 120 of the Public Health Act, 1875, gives to enforce the whitewashing and disinfecting of houses after infectious disease has occurred in them, should be

rigidly put in force. Such measures are useful in more ways than one.

They prevent the reoccurrence of disease from the same infecting source, they call attention to the necessity of disinfection and cleanliness, and, best of all, they cost money. We say best of all, for there is no more likely way to secure public attention than through the pocket. It is our experience that owners and occupiers of small dwellings will take much greater pains to prevent infectious disease getting into their houses if it costs them something to get it out. This applies more particularly to the lower and middle-classes, and it is on them that the incidence of infectious disease is most heavy.

Of the necessity for investigating every possible cause of infantile mortality, the Thirty-fifth Annual Report of the Registrar General affords ample evidence, for of 255,135 deaths of males, 105,846, or 41·49 per cent. occurred at ages under five years, and to every 100 deaths of males at all ages, 47·29 per cent. occurred at ages under fifteen years: while of 237,130 deaths of females, 91,593, or 38·63 per cent were those of children under five years of age, and 44·5 per cent. occurred at ages under fifteen years of age.

We require some other explanation than the law of natural selection if we would satisfactorily account for this slaughter of the innocents.—*Sanitary Record.*

NATURAL EUTHANASIA.*

BY B. W. RICHARDSON, M.D., F.R.S.

By the strict law of Nature a man should die as unconscious of his death as of his birth.

Subjected at birth to what would be, in the after-conscious state, an ordeal to which the most cruel of deaths were not possibly more severe, he sleeps through the process, and only upon the subsequent awakening feels the impressions, painful or pleasant, of the world into which he is delivered. In this instance the perfect law is fulfilled, because the carrying of it out is retained by nature herself: human free will and the caprice that springs from it have no influence.

By the hand of Nature death were equally a painless portion. The cycle of life completed, the living being sleeps into death when Nature has her way.

This purely painless process, this descent by oblivious

*From "Disease of Modern Life," by Dr. B. W. Richardson, now in press of D. Appleton & Co.

trance into oblivion, this natural physical death, is the true euthanasia; and it is the duty of those who call physicians to secure for man such good health as shall bear him in activity and happiness onward in his course to this goal. For euthanasia, though it be open to every one born of every race, is not to be had by any save through obedience to those laws which it is the mission of the physician to learn, to teach, and to enforce. Euthanasia is the sequeal of health, the happy death engrafted on the perfect life.

When the physician has taught the world how this benign process of Nature may be secured, and the world has accepted the lesson, death itself will be practically banished; it will be divested equally of fear, of sorrow, of suffering. It will come as a sleep.

If you ask what proof there is of the possibility of such a consummation. I point to our knowledge of the natural phenomena of one form of dissolution revealed to us even now in perfect, though exceptional, illustration. We have all seen Nature, in rare instances, vindicating herself despite the social opposition to her, and showing how tenderly, how soothingly, how like a mother with her foot on the cradle, she would, if she were permitted, rock us all gently out of the world; how, if the free-will with which she has armed us were brought into accord with her designs, she would give us the riches, the beauties, the wonders of the universe for our portion so long as we could receive and enjoy them; and at last would gently withdraw us from them, sense by sense, with such imperception that the pain of the withdrawal would be unfelt and indeed unknown.

Ten times in my own observation I remember witnessing, with attentive mind, these phenomena of natural euthanasia. Without pain, anger, or sorrow, the intellectual faculties of the fated man lose their brightness. Ambition ceases or sinks into desire for repose. Ideas of time, of space, of duty, lingeringly pass away. To sleep and not to dream is the pressing, and step by step, still pressing need: until at length it whiles away nearly all the hours. The awakenings are shorter and shorter; painless, careless, happy awakenings to the hum of a busy world, to the merry sounds of children at play, to the sounds of voices offering aid; to the effort of talking on simple topics and recalling events that have dwelt longest on the memory; and again the overpowering sleep. Thus on and on, until, at length, the intellectual nature is lost, the instinctive and merely animal functions, now no longer required to sustain the higher faculties, in their turn succumb and fall into the inertia.

This is death by Nature, and when mankind has learned the truth, when the time shall come—as come it will—that "there shall be no more an infant of days, nor an old man who hath not filled his days," this act of death, now, as a rule, so dreaded because so premature, shall, arriving only at its appointed hour, suggest no terror, inflict no agony.

The sharpness of death removed from those why die, the poignancy of grief would be almost equally removed from those who survive, were natural euthanasia the prevailing fact. Our sensibilities are governed by the observance of natural law and the breach of it. It is only when nature is vehemently interrupted that we either wonder or weep. Thus the old Greeks, fathers of true mirth, who looked on prolonged grief as an offense, attached the word madness to melancholy, even they were so far imbued with sorrow when the child or youth died, that they bore the lifeless body to the pyre in the break of the morning, lest the sun should behold so sad a sight as the young dead; while we, who court rather than seek to dismiss melancholy, who find poetry and piety in melancholic reverie, and who indulge too often in what, after a time, becomes the luxury of woe, experience a gradation of suffering as we witness the work of death. For the loss of the child and the youth we mourn in the perfect purity of sorrow; for the loss of the man in his activity, we feel grief mingled with selfish regret that so much that was useful has ceased to be. In the loss of the aged, in their days of second childishness and mere oblivion, we sympathize for something that has passed away and for a moment recall events saddening to the memory; but how soon this consoling thought succeeds and conquers—that the race of the life that has gone was run, and that for its own sake the dispensation of its removal was most merciful and most wise!

To the rule of natural death there are a few exceptions. Unswerving in her great purposes for the universal good, Nature has imposed on the world of life her storms, earthquakes, lightnings, and all those sublime manifestations of her supreme power which, in the infant days of the universe, cowed the boldest and implanted in the human heart fears and superstitions which in hereditary progression have passed down even to the present generations. Thus she has exposed us all to accidents of premature death, but, with infinite wisdom, and as if to tell us that her design is to provide for these inevitable calamities, she has given a preponderance of number at birth to those of her children who by reason of masculine strength and courage shall have most frequently to face her elements of destruction. Further, she has provided

that death by her, by accidental collision with herself, shall from its very velocity, be freed of pain. For pain is a product of time. To experience pain the impression producing it must be transmitted from the injured part of the living body to the conscious centre, must be received at the conscious centre and must be recognized by the mind as a reception; the last act being in truth the conscious act. In the great majority of deaths from natural accidents there is not sufficient time for the accomplishment of these progressive steps by which the consciousness is reached. The unconsciousness of existence is the first and last fact inflicted upon the stricken organism: the destruction is so mighty that the sense of it is not revealed.

The duration of time intended by Nature to extend between the birth of the individual and his natural euthanasia is undetermined, except in an approximative degree. From the first, the steady, stealthy attraction of the earth is ever telling upon the living body. Some force liberated from the body during life enables it, by self-controlled resistance, to overcome its own weight. For a given part of its cycle the force produced is so efficient that the body grows as well as moves by its agency against weight: but this special stage is limited to an extreme, say thirty years. There is, then, another period, limited probably also to thirty years, during which the living structure in its full development maintains its resistance to its weight. Finally, there comes a time when this resistance begins to fail, so that the earth, which never for a moment loses her grasp, commences and continues to prevail, and after a struggle, extended from twenty to thirty years, conquers, bringing the exhausted organism, which has daily approached nearer and nearer to her dead self, into her dead bosom.

Why the excess of power developed during growth or ascent of life should be limited as to time; why the power that maintains the developed body on the level plain should be limited as to time; why the power should decline so that the earth should be allowed to prevail and bring descent of life, are problems as yet unsolved. We call the force that resists the earth vital. We say it resists death, we speak of it as stronger in the young than in the old; but we know nothing more of it really, from a physical point of view, than that while it exists it opposes terrestrial weight sufficiently to enable the body to move with freedom on the surface of the earth.

These facts we accept as ultimate facts. To say that the animal is at birth endowed with some reserved force, some-

thing over and above what it obtains from food and air, would seem a reasonable conclusion; but we have no proofs that it is true, save that the young resist better than the old. We must, therefore, rest content with our knowledge in its simple form, gathering from it the lesson that death, a part of the scheme of life, is ordained upon a natural term of life, is beneficently planned, "is rounded with a sleep."—*Pop. Sci. Mo.*

CRIMINAL LAW AND MENTAL PATHOLOGY.

There is a probability that the criminal laws of all civilized countries will ere long be materially modified, to adapt them more thoroughly to the requirements of psychology. At present they seem in a transition state. The theories of insanity, especially "emotional" and "volitional" insanity, are scandalously abused in favor of (wealthy) malefactors. It is nearly evidence enough, in this commonwealth, that a man is insane if he is extraordinarily wicked. Drunkenness and mania are standing defences.

Nor are such doctrines confined to this commonwealth. Mixed up with theories of free will and necessity, they come to us from abroad. At the last meeting of the German Congress of Naturalists and Physicians, at Gratz, a paper was read by Prof. Benedict, on the history of crime with regard to ethnology and anthropology. He touched upon delicate ground, asserting that every action is based less on liberty than on compulsion; that our acts are governed by natural laws and not by theological opinions, and that punishment may act as a corrective of perverted human nature, but is chiefly the outflow of the desire of society to avenge wrongs inflicted upon it. The best prevention of crime depends upon the increase of our knowledge of those circumstances that necessarily engender it.

A very similar opinion was advanced, or rather timidly suggested, by Dr. Austin Flint, in the address on "Practical Medicine," at the last meeting of the American Medical Association. After directing attention to the influence which hereditary mental taint, the prejudices of education or the want of it, and disease of the mind, bring to bear on the moral consciousness, He adds:—

"I will not assert that criminal conduct always proceeds from morbid conditions; such an assertion would, perhaps, come into conflict with theological doctrines, and I have no desire to be aggressive in that direction."

If Dr. Flint means that he is afraid to say what he thinks, lest some theologian shall attack him, his caution is excessive. His *recommendation of a "Natural History of Crime" is*, however, most excellent, and whatever its results as regards theories its practical benefits could not be other than most valuable. Its importance is daily becoming more obvious. Professor Ordronaux, New York State Commissioner in Lunacy, in his report, recently submitted to the legislature, says:—

"Crimes of a violent character are multyplying with a fearful rapidity, and every circle of society seems to contribute its quota to swell the number of perpetators. Causes of a manifold nature acquired by ancestors, transmitted to offspring, and by them steadily intensified, tend to produce a series of results, which last expression is either insanity or crime, or both."

In penal legislation, two reforms are urgently needed, the one which will do away with the plea of insanity as the unfailing excuse for villainy; and the other, a change of the theory of penal legislation. At present, this is either that society revenges itself for a wrong done to it, or that it makes of punishment a warning to the evil disposed. The first of these theories is avowedly erroneous, and the second is impotent. The history of crime shows that not the most terrible punishments can check it; that, in fact, their severity is not what is deterrent in them, but their *certainty*. Therefore, the easy refuge of showing doubtful sanity as an excuse is most hurtful.

The progress of criminal law has been toward milder penalties. This should suggest its future reform. Do away with the death penalty altogether, do away also with the plea of insanity but make crimes of the first magnitude punishable by lifelong imprisonment, without the possibility of pardon unless innocence be shown. The punishment for crime should be *compulsory education*, and that is what imprisonment should mean.

Preventive measures should also be taken. Professor Ordronaux believes that the State would be justified in passing a law making it necessary that every violent epileptic should, if at large, have a committee of the person appointed, who should give bonds for his peaceful behaviour and safe custody, and be authorized to surrender him into the custody of an epileptic asylum whenever his condition may require it.

The power of the will lies in the supremacy of reason to emotion. Let no metaphysical cobweb of fatalism interfere with the efforts of practical reformation.—*Med. & Surg. Rep.*

TYPHOID ATTRIBUTED TO VACCINATION.—A curious epidemic of typhus [typhoid?] is reported to have occurred in a large institution for young ladies in the Commune of Cam-

pomarone, near Genoa. One of the inmates, of whom there are over 130, having been attacked with small-pox, Dr. Parodi, the medical attendant, very properly determined to vaccinate all who were liable to infection, and commenced with the 50 eldest girls, thinking them most susceptible, as longer time had elapsed since their previous vaccination. Ten out of the 50 succeeded. Three weeks afterwards 34 of the unsuccessfully vaccinated took typhus [typhoid ?] almost simultaneously, and 3 died. The previous health of the institution had been excellent. The lymph employed was human, and the medical attendant does not hesitate to assert it was the cause of the fever. He explains the fact that those successfully vaccinated escaped the fever by supposing that the two poisons neutralised each other.—*The Doctor.*

INFANT FEEDING AND INFANT MORTALITY.—In his quarterly report on the health of Brighton, which has just been issued, Dr. Taaffe gives some interesting details respecting the relation of infant mortality and improper feeding. During the quarter no less than seventy-three children died at Brighton from diarrhœa, of whom fifty-eight were under one year. Of these fifty-eight cases it was found that twenty-five were fed by the bottle (six of these on condensed milk, ten by the bottle and artificial food, four were nursed by the mother and fed from the bottle, two were fed entirely upon artificial food, one was fed on condensed milk), one on condensed milk and bread-sop, and one on milk and oatmeal. In eleven cases only were the children nursed by the mother; from which it is deducted that improper feeding and improper nursing are unmistakably among the principal causes of infant mortality from diarrhœa. Not only is the kind of food injurious, but it is given to infants far too frequently. Dr. Taffe says—"If you ask a mother how often she nurses her baby, the answer will almost always be 'Whenever it wants it'; and that means in many cases constantly." And he asks—"How is it possible that infants can be reared by such improper feeding?" He lays down the following rules:—"No infant at the breast, or who is being brought up by hand, should be fed more than once in four hours during the day, and twice in the night; and for the first six or seven months the food should be either that supplied by the mother, or milk (two-thirds) and water (one third) sucked from a bottle. No child under these ages should ever be fed by the spoon or receive farinaceous food of any kind. In using condensed milk care should be taken to dilute it sufficiently." If these rules were adhered to among the poorer classes there would undoubtedly be an immense decrease in the mortality among infants from diarrhœa.—*Med. Times and Gazette.*

FORCE AND WORK.—Work without implies work within. No exercise of force can be made except by the generation and use of force of which no part enters into the external result. The use of muscles involves use of nerves. The external force, if exerted by a muscle, is only part of that which it produces. Now the proportion between these two in their several degrees is a subject of great practical importance, and some interesting facts have recently been published by Helmholtz From these it is clear that the greater the external force exerted, the greater is the proportion of the needful internal force—that is, great exertion is more wasteful than moderate exertion. Then force has to be evolved in proportion to the external work done, and therefore the greater is the wear and tear of the animal machine. The same increased proportion of non-productive work is seen when the external energy is below a moderate amount. It is found, for instance, that in walking, a speed of three miles an hour gives the most economical use of the forces. No doubt in these facts we have an index to much of the ill effects of the present high-pressure rate of work and life. The waste of force is out of proportion to the work done. More is effected in a given time, but the body feels it more, and its working period is proportionately shorter. These facts cannot be too often repeated or too constantly remembered by those who have the regulation of labor.—*Lancet.*

MILK AND THE DISSEMINATION OF FEVER.—Acting on the suggestions of the Police Board of Glasgow, the Board of Supervision of that city has issued a circular recommending all local authorities in whose district there may be dairies or dairy farms which supply the public with milk to observe the following rules and precautions:—"1. All such dairies and farms, together with their steadings and other surrounding circumstances, should be carefully inspected from time to time with reference to their water-supply and their general sanitary arrangements, such as the arrangements as to washing houses and disposal of excrement, and the position of midden-steads. 2. The local authority should also cause inquiries to be made from time to time as to the existence of contagious or infectious disease at such dairies and farms; and whenever such disease is found to exist at any of them, they should immediately (1) take such steps as their medical officer may advise, with a view to prevent the dissemination of the disease, and (2) give notice of the facts to any other local authority within whose district milk from the infected premises may be distributed or sold."

THE SANITARY JOURNAL.

Communications solicited from Medical Men and others on all subjects pertaining to Public Health.

VOL. II. TORONTO, MARCH 1ST, 1876. No. 3.

TYPHOID FEVER.

The highly important and interesting question involving the causation of typhoid fever, notwithstanding the observations and investigations of eminent health officers in England and of the Massachusetts Board of Health, remains still without a satisfactory answer. In one sense it appears to be, as it were, enough to know that it is what has been called a filth disease; and to get rid of the filth is to get rid of the fever; that is, if we take care, at the same time, to include and get rid of the foul gases arising from the filth. Nevertheless, the inquiry is of an urgent character, and its satisfactory solution will confer a great benefit upon modern life.

In another part of this JOURNAL mention is made of a severe outbreak of typhoid near Genoa which appears to have had its origin in the lymph used for vaccinating a number of young ladies at school. In the *Sanitary Record*, Jan. 29, 1876, the following account of an outbreak is given by Dr. Mackintosh, Medical Officer of Health, Chesterfield, Eng., the Dr observing he can give many more of a like description:

"About ten weeks ago, in a little hamlet in my district—with a population of 200, elevation above sea level 600 feet, on the millstone grit—ten cases of typhoid fever occurred in one week, where no fever has been, to my own knowledge, for the last three years. I made every investigation at the time, endeavouring to trace the outbreak to some source of contagion, but failed. It happened, however, during the convalescent stage of those cases that recovered, that while water was being drawn from one of the wells in the place, a turnip almost devoid of its leaves came up in the bucket, consequently the well was thoroughly examined, and no less than twenty of these roots were found in it, the leaves having

decayed, and were partly dissolved and partly suspended in the water. In every house where the water from this well was used the fever appeared, and in no other, and when the well was cleaned out, water and all, it immediately disappeared from the village."

The editor of the *Medical Press and Circular* says he has recently heard it urged that, in the great number of cases *improper food* is the cause of the disease; and as applied to the instances of typhoid fever arising from milk diluted with sewage water, that it was not the latter *per se*, but its action upon the milk, leading to a degradation of this fluid, that we should deem the *fons mali*.

Dr. Snow, Registrar of Providence, Rhode Island, in a late report he has made, after noticing the various supposed causes of typhoid, observes:

"But while we find that none of the causes referred to, in all cases, or constantly, produce typhoid fever, there are individual instances in which the disease seems to be evidently produced by each of the causes named. Whatever causes of this description may be in operation, it is possible that individual peculiarities, susceptibilities or idiosyncrasies may have more to do with the production of the disease than is generally supposed. At any rate, we know that external causes, to all appearance precisely the same, do not produce similar results in any considerable number of cases."

In view of these facts, and also of the fact that there is evidence to show that men employed to work in sewers enjoy marked immunity from typhoid, two interesting questions came up for solution:—First, as to the nature of the predisposing cause, the "individual peculiarities, susceptibilities, or idiosyncrasies;"—the nature of the soil, so to speak, most favorable to the development of the disease in the individual. Does not typhoid more frequently than other contagious diseases affect those whose health had previously been rather below par?

Secondly, as different outbreaks and cases of so called typhoid fever, present striking features of diversity, do they all arise, or are they all caused, by the same specific contagium? Or are there two or more forms of virus giving rise to two or more distinct diseases, hitherto confounded together? It is

well known that previous to the time of Jenner, two or three forms of continued fever, especially typhus and typhoid, had been confounded together. Even so late an authority as Dr. Thomas Watson says, "I conceived, and I taught, that the differences in the aspect and phenomena of continued fever depended more upon what is called the epidemic constitution, than upon any essential difference in the nature of the disease itself, or in the virus from which, as he believed, it sprung." And as Jenner traced out distinct lines of division between typhus and typhoid, and as there is now no doubt that they have a distinct source, and are caused by distinct poisons, may it not be learned hereafter that there are more than one form of specific contagiums giving rise to what is now commonly known as typhoid?

EXAMINATION OF MILK.

The milk supply of Toronto appears now to be attracting more than usual attention. We have repeatedly endeavored to awaken an interest in this important matter. Below we give some practical rules, chiefly on the authority of Dr. Parkes, by which inferior, diluted, or adulterated milk may be detected; but as we have before strongly hinted, and as is shown by the letter of Dr. Canniff, in another page, the impurities most to be feared in Toronto, and in most cities, in the winter season especially, is that peculiar to milk from diseased, badly housed, and filthily-kept cows. These impurities are much less readily detected, and require the aid of a good microscope.

Milk from diseased cows soon decomposes and becomes acid. It may contain colostrum, heaps of granules collected in roundish masses, puss cells, epithelium, or, occasionally, blood. The microscope usually detects abnormal cell forms, and casts of lacteal tubes. The only natural constituents to be observed in good milk by the microscope are oil globules of various sizes in an envelope, and a little epithelium.

Good milk placed in a narrow glass should be quite opaque, of full white color, without deposit, peculiar smell, or taste; when boiled it should not change in appearance. It should be

very slightly acid or neutral, or very feebly alkaline. A little litmus paper will show the degree of acidity or alkalinity to a limited extent; acidity changing the blue litmus to red, and alkalinity restoring the blue. If the milk is strongly alkaline, the cow is probably diseased, or sodium carbonate has been added.

The most common adulterants of milk are water, and chalk or starch; the latter to conceal the thinness produced by the water. The addition of water is best detected by the *specific gravity* (shown by a lactometer, which may be easily obtained), and the *proportion of cream.*

The *specific gravity* of good milk varies from 1026 to 1035; the average being 1030 at 60° Fahr. A very large quantity of cream (a rare ingredient) lowers the specific gravity. The following table from Parkes shows the specific gravity at 60°, with the addition of different quantities of water, as determined by several experiments; showing that of two qualities of milk :—

	SP. GR.	SP. GR.
Original specific gravity,.....	1030·5.....	1026
9 pts. of milk, with 1 of water	1027	1023
8 " 2 "	1024	1019
7 " 3 "	1021	1017·5
6 " 4 "	1018	1016
5 " 5 "	1015	——

The *quantity of cream* in milk is a fair indication of its quality. To determine this, obtain a tall glass vessel, say at least 12½ inches in heighth; mark with a compass 100 equal lines, ⅛th of an inch asunder, on a piece of paper and gum it on the glass. Put sufficient of the milk in the vessel to reach the top of the graduated paper, and allow it to stand in a cupboard, secured from currents of air and radiated heat, for 5 or 6 hours, at a temperature of from 45° to 65°. By this means the percentage of cream may be seen; and also the presence of deposit or sediment, if any, may be observed. There should be from $\frac{8}{100}$ths to $\frac{10}{100}$ths cream; usually in good milk about $\frac{8}{100}$ths. Alderney cows, it is said yield much more. If left standing too long, as for 24 hours, it may read less, probably from aggregation or condensation of

the fat particles. If the temperature of the milk is allowed to alter, there will be circulatory currents in it, which will effect the rising of the cream.

Any deposit before the decomposition of the milk, will probably be chalk or starch. If chalk, it would perhaps effervesce on the addition of a little acetic acid to the sediment; if starch, a little iodine would give the well marked blue color.

To judge as to the dilution of milk by its specific gravity alone is very misleading, and to act upon judgment so formed would be rather to offer a premium on dilution. The cream being much lighter than the skimmed milk, by removing the cream considerable water may be added to lower again the specific gravity, which would rise on the removal of the cream. Hence, dealers might soon learn to offer diluted skimmed milk.

What is wanted then, first of all, is thorough inspection of the byres, and inspectors empowered to see that these and the feed of the cows are as they should be; then to test the milk as to its specific gravity and proportion of cream. And no doubt, wonderful indeed would be the improvement in the quality of this important fluid.

Annotations.

SANITARY MATTERS IN INDIA.—The London *Lancet*, Dec. 18, on the subject of sanitary work in India, observes: "We have brought, at an enormous cost, under decent sanitary control the British army in India—numbering, say, 70,000 men; we have made a respectable beginning of getting under like control the Native army—say of 130,000 men, we have started sanitary works, on European models, in the capital cities of the Presidencies, with their collective population of, say, 2,500,000; and for the balance of the population of India—say, 180,000,000—we have provided some twelve sanitary commissioners for provinces and a few medical officers of health for big towns, and have through them induced local sanitary action at a few points. We have also promoted vaccination. We learn that Madras has recently spent, £150,000, stg, on water works, and will require to spend more. The estimated cost of a proposed drainage scheme for the town is £400,000, stg. Calcutta, has spent

enormous sums upon water and drainage. Bombay is going to carry out a drainage scheme, and other towns are not behind hand in such work.

CRAMMING AND OVER-WORK, AT SCHOOL.—On this subject a late number of the *Lancet*, Lond., comments as follows; the two first sentences we should like particularly to impress upon parents: "It should never be forgotten that youth is the period of growth and development, and that the boy is then laying in the stock of health which has to bear him bravely through the vicissitudes and struggles of adult life. A few hours of work can speedily be made up later on, but nothing can restore the tone to the jaded nerves exhausted by premature toil and excitement. In the same manner that factory children are protected from excessive physical labor ought the children of our middle-classes to be protected from the excessive strain that ambitious parents and school-masters would put on them. A gentleman connected with an educational establishment of high standing, and who has often spoken with authority on educational questions, considers the question to be worthy of Government inquiry. Only a Royal Commission could get at the real truth and reveal the amount of mischief that has been done by the reckless employment of the grinding system.

DRESS REFORM.—This subject is commencing to attract, as it certainly should, some attention. Not long ago Dr. Atlee, President of the Pennsylvania Medical Society, delivered an address, strongly condemning the confining of the waist, the weighty dress, the fashionable shoe, &c. In Finland the subject has been approached in a very practical manner. A meeting for opposing extravagance in dress has been held in Ihveskyla, Finland, which was visited by a large number of ladies; and the following, from the *Health Reformer*, is part of an address read by one of the ladies:—'We love our native land. We love its people. May we then express love, not only in words, but also in acts, with our judgment, and in our whole appearance. Some have spoken against excess in drink; we Finnish women would enter into a covenant to oppose excess and vanity in dress. How much it becomes us, who are surrounded by the youth and children, to set good examples before them, setting forth in our dress, simplicity and true humility! The eyes of the children are fixed upon us as we set forth the truths of Christianity and the truths of knowledge. Shall we then appear before them clad in the modern disgustful and whimsical apparrel which causes wonder and laughter? No; we would together decide, as true friends of our country, to be faithful in the smallest matters and to make use of the

practical and most simple of fashions." After a short discussion, the list brought forward was signed by about forty females, and the society agreed to hold a future meeting.

MORTALITY OF MONTREAL.—Although the death rate of Toronto is greater than that of most cities of much larger dimensions in England and the United States, it is considerably less than that of Montreal. The total number of deaths last year in the latter place was 6,311. The death rate it appears ranged from 35 to 42. This is certainly, as the Mayor puts it, "truly appalling." Nearly one-eighth of these, or 784 were from small-pox; of these, 653 were French Canadians. This is attributed to neglect of vaccination; and while this neglect may be the chief cause, general unhygienic conditions, as regards this class, probably adds greatly to the death rate from small-pox. According to the *Public Health Magazine*, there were last year, however, 432 deaths less than in 1874. Though it does not appear that this decrease is attributed to having an experienced physician at the head of civic affairs, or to sanitary improvements, yet it is quite natural to conclude that to such the decrease is probably largely, if not wholly, owing.

PATHOLOGY OF SMALL-POX.—Professor Wm. Osler, of McGill University, Montreal, says in the *Canadian Medical and Surgical Journal*, within the last eighteen months two investigators, one working at ovine, the other at human small-pox, have shown that this disease must be included in the list of those, as Diphtheria, Erysipelas, Typhoid, &c., in which the presence of some of the lower forms of vegetable life have been, it would seem, pretty clearly demonstrated. Dr. Klein has been experimenting upon sheep, and Dr. Weigert, of Breslau, upon man. The former gives a remarkably full and clear description of the development of an organism going hand in hand with the development of the lesions characteristic of the disease. In the latter case the account is much less complete. The researches, especially Dr. Klien's, says Dr. Osler, places the germ theory on a basis which heretofore it has not possessed.

THE BRIDGE RURAL SANITARY AUTHORITY has originated a memorial to the Local Government Board on the subject of infectious diseases. This memorial, for the object of which they seek the support of other sanitary authorities, asks for power to compel medical men, and the friends and relatives of persons suffering from infectious diseases, to give information to the health authority; householders who neglect to give such information to be subject to a penalty, while medical practitioners

are to receive a fee for each case reported. Such a law in Canada, by means of which the public would know where infectious disease existed, would aid greatly in preventing the spread of such.

ANOTHER STATE BOARD OF HEALTH—Pennsylvania is to be the next state to fall into rank with those having Boards of Health. The *Medical and Surgical Reporter* gives the text of the Act as it has been passed by the Senate, and referred to the House. It is similar to the Act of other States. It enacts that the Governor in Council shall appoint five physicians, of skill and experience, and ten years' standing, as sanitary commissioners, which, together with the Attorney-General of the State, and the Secretary of Internal Affairs, shall constitute a Board of Health. The term of office and duties of the Board are defined. The Secretary only shall receive a salary, but the actual expenses of the other members, while on duty, shall be paid. $8,000 is appropriated from the treasury for the purposes of the Act. The Act shall take effect immediately.

TO CORRESPONDENTS.

R. W.—"Powell's life line," is represented by a band or cord passed around the head upon the eye-brows and the occipital protuberance (the prominence or *process* at the back of the head). It is said that if this line passes at the distance of an inch or more from the orifice of the ear, there is no consumption in the individual's blood, and he, or she, will likely be long-lived; whereas, if the life-line is but half an inch or less from the orifice, the life will be short, and usually scrofulous.

STUDENT.—The following are among the best works on Sanitary Science: A Manual of Practical Hygiene, by E. A. Parks, M.D., &c., &c., fourth edition, 8vo. p. 665; Manual of Public Health, by W. H. Corfield, M.A., M.D., and others, edited by E. Hart, 12mo.; Hand Book of Hygiene and Sanitary Science, by Geo. Wilson, M.A. M.D., &c., second edition, 12mo.; A Work, Lectures on State Medicine, by F. De Chaumont, M.D., &c., has just been issued, and is well spoken of by reviewers.

AQUA.—There cannot be any doubt as to the advantage of boiling suspected water before using it. This was well known to the ancients. Herodotus writing of a period about 550 B.C., states that the king when on a campaign was supplied with abundance of water from the river Choaspes, previously boiled, and stored in silver vessels.

THE EDITOR deems it necessary to state that he does not wish to be considered responsible for anything which appears in the SANITARY JOURNAL not from his own pen.

SUBSCRIPTIONS RECEIVED since 31st January:—Hon. Vice Chancellor Blake (for 1875), Messrs. W. A. Baldwin (1875 and 1876), Langley, Langley & Burke (1875 and 1876), Toronto; Dr. James A. Grant (1875), J. Sweetland (1875), Hon. D. Laird (1875), Ottawa; Henry Lyman (1875), Montreal; Dr. R. P. Boucher ('75), John Bertram ('75), Peterboro'; Messrs G. Moberly ('75), C. Cameron ('75), Collingwood; Dr. F. M. Wafer ('75 and '76), Kingston; Dr. W. C. Corson ('75), Brantford; Drs. L. Langstaff ('76), Springhill; Wm. Springer ('75), Messrs. Wm. McGregor, M.P. ('75), Windsor; J. L. Biggar, M.P. ('75), Murray; John Fleming, M.P. ('76), Galt; James Dawson, M.P.P., ('75), Sombra; Dr. Jas. Hayes ('75), Simcoe; D. Sinclair (1875).

TO OUR READERS.—The *Pacific Medical and Surgical Journal* hints to its subscribers that the present centennial would be a good time to square accounts. We would hint that any time at all, the sooner the better, would be a *good* time to us for our readers to pay up. Please remit.

THE TORONTO TURKISH AND VAPOR BATHS, advertised in another page, ought to be well patronized, not only by the citizens of Toronto, but by the profession in the country. There can be no question as to the therapeutic value of these baths in certain diseases, and patients can be sent here and receive the benefit of them, while the advice and treatment of their regular medical attendant will not be in any way interfered. Dr. Diamond has supplied a want.

THE WAKEFIELD EARTH CLOSET, is one of the latest improvements, truly a perfect marvel of completeness and efficiency; every one should see and examine it. At Cleverdon & Coombes, 35 Front St., Toronto.

MRS. PEARSON'S SUPPORTER.—The *Canada Lancet* says: "This supporter is not as well known as it deserves to be, as there is no doubt it is the best or the kind in use. It is an invaluable aid in the treatment of all uterine diseases requiring the use of a supporter. Wherever tried it has given good satisfaction; this is, we think, the best test of its value that can be given. See advertisement on another page.

PUPLIC HEALTH, London, England.—The increasing demand for this excellent journal has necessitated an expansion of its publishing facilities. It numbers among its contributors many of the leading sanitarians in the profession in Great Britain. Abbotts Smith, M.D., M.R.C.P., &c., Editor. It has not come to hand regularly for several weeks past however; we suppose the Post Office Department is at fault.

THE LONDON AGENCY OF THE SANITARY JOURNAL is at the office of "*Public Health*," London, Eng., 9s. stg., per an., free of postage: and subscriptions are received at the office of the SANITARY JOURNAL for *Public Health*.

THE SANITARY RECORD, London, Eng., comes regularly to hand, and is much valued, being a valuable and interesting publication.

THE ADVERTISEMENTS in the SANITARY JOURNAL might prove profitable to the reader. Look at them all.

PERSONAL.—We congratulate Dr. C. O'Reilly, late of Hamilton, and Dr. James White, Hamilton, on their appointments—the former as Medical Superintendent of the Toronto General Hospital, the latter to the same office in the Hamilton Hospital.

DR. LOGAN, Secretary of the State Board of Health, California, died February 13th at Sacramento. He had been President of the American Medical Association.

For $4, Vol. 1, neatly bound, and vol. 2, for the current year, will be sent, postage paid to any address.

THE PURPOSE OF THE SANITARY JOURNAL is to diffuse a knowledge of sanitary science—a knowledge of the causes of diseases and of the means of avoiding or removing these causes; to arouse public attention and the attention of the medical profession to the vast amount of preventable disease prevailing; to advocate Sanitary Legislation; to discuss, in short, all questions pertaining to public health, water supply, ventilation, drainage, food, clothing, bathing, exercise, &c., &c.

COMMENDATORY LETTERS TO THE EDITOR.

The following are copies of, and extracts from, a few of the many letters to the Editor, received from time to time, from medical men and others, regarding the SANITARY JOURNAL, unsolicited, of course, and, with two or three exceptions, the writers being personally quite unknown to the Editor:

TORONTO, December 7th, 1875.

DEAR DR. PLAYTER :— . . Please send me your receipt for the enclosed two dollars, for your valuable Journal. I wish all in the profession valued it as I do. . . .

Very truly, JOSEPH WORKMAN, M.D.
(Late Supt. Toronto Lunatic Asylum.)

BOWMANVILLE, June, 1875.

DEAR SIR :—I am much pleased with your Journal . . . I look upon it as one of the most useful periodicals with which I am acquainted, and especially to the medical practitioner, who wishes to keep pace with the advancements of science. Yours truly, W. ALLISON, M.D.
(Member Medical Council, Ont.)

GLANFORD, ONT., November 22nd, 1875.

DEAR SIR :—Enclosed you will find $2, to be applied to SANITARY JOURNAL. . . . . I think your journal is doing a good work, and that such a magazine was much needed in Ontario. Wishing it every success,

I remain, yours truly, ALEX. BETHUNE, M.D.
(Member Medical Council, Ontario.)

OAKVILLE, March 18th, 1875.

MY DEAR DOCTOR :—Enclosed please find one dollar for your really valuable Journal. . . . . Accept my best wishes for the success of your new enterprise. Yours faithfully, D. D. WRIGHT, M.D

DUNDAS, September 10th, 1875.

MY DEAR SIR:—Please receive the enclosed $2 for the SANITARY JOURNAL. Your moderately-priced monthly contains much that is of interest to the reading public of all classes. . . . Much valuable information as well fitted for the general reader as for the professional student. It ought to receive a large measure of support, and I heartily wish it every success.

I am, my dear sir, yours truly, JAMES HAMILTON, M.D.,
(Late Member Medical Council, Ont.)

LANSING, MICH., August, 12th, 1875.

DEAR DOCTOR:—I am much pleased with your Journal. . . . . I read it with interest, and satisfaction, and sincerely hope its circulation may be increased, believing, as I do, that the interests of public health will be advanced thereby.

Very respectfully, H. B. BAKER, M.D.
(Sec'y Michigan State Board of Health.)

TORONTO, December 13th, 1875.

Dr. PLAYTER,—*Dear Sir*:—Enclosed find amount of subscription to the SANITARY JOURNAL. I am much pleased with it, and feel that I cannot say too much in its behalf. . . . I hope the publication will receive the support its merits deserve; it should be carefully studied by every man, woman and child.

Yours very truly, DONALD MCDONALD.
(Senator Dom. Can.)

NEWMARKET, January 5th, 1875.

DEAR SIR:—I have received, with much pleasure, two numbers of the SANITARY JOURNAL. I congratulate you on the start, and wish you every success in the progress of this important branch of medicine. Will do all I can to forward its interest. Yours respectfully,

J. GRANVILLE HOCKRIDGE, M.D,

WARKWORTH, November 17th, 1875.

DEAR SIR:—I appreciate your journal very much. It contains information but little understood by the mass of the profession. I give you my best wishes.

Yours truly, P. D. GOLDSMITH, M.D.

HEALTH DEPARTMENT,
MONTREAL, November 26th, 1875.

DEAR SIR:—Enclosed, with the amount of one year's subscription, you will find a list of prominent citizens who will willingly, I think, subscribe for your valuable Journal. Yours truly JAS. I. FLYNN.

The following are Notices of the Sanitary Journal by the Press.

THE CANADA LANCET says:—"*The* SANITARY JOURNAL is very well got up and contains good articles on Public Health. We wish our contemporary every success."

CANADA MEDICAL RECORD, MONTREAL.—"This is the only Sanitary Journal published in Canada * * * we wish it every success, and trust it will be the means of doing much good."

MEDICAL TIMES AND GAZETTE, LONDON.—"The Sanitary Journal, edited by Edward Playter, M.D., Toronto. The July number of this publication . . . contains some original communications on lead-poisoning, vaccination, sanitary legislation, water supply, etc. . . . The matter is well written."

PENINSULAR JOURNLA OF MEDICINE.—"We welcome to our list of exchanges the SANITARY JOURNAL. It presents a very neat appearance, its selections are well made, and its editorials exhibit an abillty competent to the consideration of this important branch of science. We wish the new comer a long and vigorous life."

NEW YORK SANITARIAN.—"We welcome the first number of this effort to popularize Sanitary Science. Sanitary Science; Means which shorten life; Effects of Tobacco; Rules for preventing the spread of Contagion, with twice as many equally suggestive editorial headings, indicate a manly grasp of the enemies of human health, and we hope for it a long life and a vigorous contest."

POPULAR SCIENCE MONTHLY, New York, "THE SANITARY JOURNAL, edited by Edward Playter, M.D., Toronto, both in its editorial and its selected matter, gives evidence of being conducted with ability. It is to be hoped that the enterprise will be sustained by the Canadian public."

KINGSTON BRITISH WHIG, "The SANITARY JOURNAL, edited by Dr. Playter, is performing a very useful mission, in instructing the public mind on some of the questions which vitally affect the public health. The papers are written very ably, and interest one while they convey a large amount of information. The publication should have a wide circulation."

LEADER, Aug. 9, '75.—"The SANITARY JOURNAL, edited by E. Playter, M.D:—This valuable journal, since its new form of issue, seems to increase in excellency. The papers are written on all important subjects connected with public health. The selections are made with special reference to every day matters of household hygiene. The number contains some valuable editorials. We can only say, as we have said before, that for this alone the serial should be in every household."

TORONTO GLOBE.—"This is a series of admirable papers on Health. We commend it to all who are wise enough to believe their own organization of as much importance as any other study."

HEALTH REFORMER.—It takes the right positions on the temperance and tobacco questions, as well as general reform. We trust that the people of Canada are sufficiently awake to their interests to give it the support which it well deserves.

LONDON FREE PRESS.—The contents are valuable, conveying to the general reader in a pleasing style many things bearing upon health, with which all should be acquainted."

OTTAWA TIMES.—"A knowledge of Sanitary Science is no mere accomplishment; it is a positive necessity if there is to be a fair modicum of attention paid to the prevention of disease and the prolongation and enjoyment of life. * * The SANITARY JOURNAL is neatly got up in every respect. The selections are carefully made and from good authors. * * In the editorial department there is a very excellent article on Preventive Disease. "Defective Drainage" is also treated with considerable power. The magazine is altogether a creditable production, and ought to command a wide circulation.

KINGSTON DAILY NEWS.—"We have received the third number of this valuable magazine, the contents of which are of surpassing importance to every citizen. Ventilation, drainage, and cleanliness, commend themselves to every one desirous of enjoying good health or prolonging life, and these are fully treated of in the pages of the SANITARY JOURNAL. We hope it will be extensively patronized not only by the medical profession, but by the people generally, in whose interest it is published."

Contributors to the SANITARY JOURNAL:—Drs. JOSEPH WORKMAN, WM. CANNIFF, C. V. BERRYMAN, WM. OLDRIGHT, GEO. WRIGHT.