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THE  
SANITARY JOURNAL.

DEVOTED TO  
PUBLIC HEALTH.

EDITED BY  
EDWARD PLAYTER, M.D.

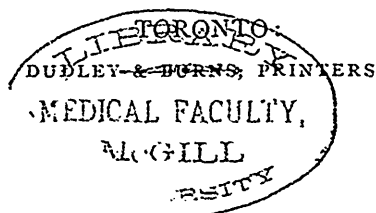
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VOLUME I.—1874-5.

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*SALUS POPULI SUPREMA EST. LEX.*

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# THE SANITARY JOURNAL,

DEVOTED TO  
PUBLIC HEALTH.

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VOL. I.]

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## Selected Articles.

### SANITARY SCIENCE.

In a very exhaustive discourse delivered at the Birmingham Town Hall, and published in *Nature*, Professor Corfield alluded to sanitary science as a thing of yesterday, comparatively speaking; but sanitary art, the art of preserving the health, whether of individuals or of communities, he remarked, has been studied and practised for ages. Sanitary science is the latest and highest development of medical science because of the extreme importance of its objects and results. It is the study of the causes of diseases, and it points out the means of preventing them; and I am sure, continued the lecturer, you are all agreed that "prevention is better than cure;" as Rollet of Lyons well said, "*Medicine cures individuals, hygiene saves the masses.*" But while we contrast hygiene (another name for sanitary science) with curative medicine, we must not forget that it is altogether a medical science, and that its great lights have been all medical men (mind, I am not speaking of the art now, but of the science), and this is necessarily so, and

always must be so. I have said that sanitary science is the study of the causes of diseases, of the modes in which they originate, and in which they spread from one person or place to another. It is therefore only those who are acquainted with disease that are competent to deal with it all, and these are those who have made medical science generally their special subject. \* \* But if sanitary science is a thing of yesterday, such is not the case with the observation of sanitary facts, nor with the practice of sanitary art; and while it is true that sanitary science is essentially and entirely a medical study, and is necessarily so, it is equally true that *the practice of the art of preserving the health is not only possible to all, but is a duty which devolves upon all*. In all ages we have had writers on this subject. From all countries we may learn useful lessons about it. From the times of Hippocrates, Galen, and Celsus we have had records of the results of observations on the methods of preserving the health; from the time of Moses we had lawgivers imposing sanitary conditions of existence upon unwilling, because ignorant populations. We look upon the immense engineering work undertaken and carried out by the Romans to supply their towns with pure water with astonishment, and we turn round and see our own towns supplied from polluted rivers, or, worse still, from shallow wells dug in the soil upon which they themselves stand, well supplied in most cases chiefly by the foul water which has percolated from the surface of the ground. We have found out in later times that one of the main conditions of the health of communities depends on the purity of the drinking water, and we see that the Roman engineers, by having to go to a considerable distance for water in order to get it to a sufficient height in their cities, accidentally, as it were, fulfilled one of the most important of sanitary requirements.

"Knowledge is power," and as we come to know more of the conditions which favour the spread of diseases, as we do daily, it is our own fault if we neglect to use the power which that knowledge gives us. There are two conditions of insalubrity which are pre-eminent. I hardly know which to place first. The one is overcrowding, and the other the accumula-



tion of refuse matters in and about dwellings. These conditions were those which especially favoured the spread of the fearful plagues of the middle ages. \* \* I consider that one of the most important conclusions that the study of sanitary science has forced upon us lately, is the conclusion that the immediate removal of refuse matters is one of the first necessities of the healthy existence of a community. There are those who would have you believe that refuse matters may be rendered innocuous in one way or another, so that they may be kept with safety in and near to houses. Don't listen to them: the principle is wrong—radically wrong. Depend upon it that the true method is to get rid of such matters at once, and in the simplest possible way, and that is the cheapest plan in the end. Show me a town where refuse matters are kept—no matter how they are treated—and I will show you a town where the standard of vitality is low; I will show you a town with a high death-rate, especially among children.—*Medical Press and Circular.*

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### MEANS WHICH SHORTEN LIFE.

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*Extract from "The Art of Prolonging Life," a deservedly popular Work, by Hufeland, a celebrated philosophic Physician and Professor of Medicine in the University of Jena.*

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I now proceed to the most important part of this treatise, the Practical Art of Prolonging Life; and I can now make known with confidence and on good grounds, those means by which alone prolongation of it is possible. If they are not so specious, so boasting, and so mysterious as those commonly recommended, they have this advantage, that they may be everywhere found without expense, nay, that they in part lie within ourselves; that they are perfectly consistent with reason as well as experience; and that they prolong, not merely life, but also the enjoyment of it. In a word, according to my idea, they deserve the name of universal remedies, much more than all the panaceas of quackery and imposture.

We are continually surrounded by the friends and the enemies of life. He who keeps company with its friends, will become old; but he who prefers its enemies, will shorten his existence. It might be expected of every prudent man, that he would prefer the former, and be always on his guard against the latter, but it is an unfortunate circumstance that these enemies of life are not all public and known. They, in part, carry on their attacks secretly and imperceptibly: so that some of them assume the mask of life's best friends. It is, therefore, difficult to discover them; and some we even harbor within our own bosoms.

The principal part of this Art, then, will consist in being able to distinguish our friends from our enemies, and in learning to guard against the latter. In other words, the Art of Prolonging Life may be divided into two parts:

- I. Guarding against the enemies of life, and those means which shorten it.
- II. The knowledge and use of those means which tend to prolong it.

MEANS WHICH SHORTEN LIFE.—According to the principles before laid down, the only grounds on which the duration of life depends, it will not be difficult to determine in how many different ways it may be shortened.

- 1st. Everything must shorten it which lessens the sum of the vital power.
- 2d. Everything that takes from the organs of life their duration and renders them unfit for use.
- 3d. Everything that hastens vital consumption.
- 4th. And everything that prevents restoration.

Everything that shortens life may be comprehended in these four classes; and we have now a standard by which the greater or less mischief occasioned by their influence can be determined and appreciated. The more these four properties are in anything united, the more dangerous and hostile will it be to our vital duration; and the fewer it contains it will be less so. Nay, there are mixed substances, which present as it

were two sides, one friendly and another hostile ; that is to say, which possess one of the above properties, but at the same time are more beneficial and favorable to us than hurtful. These may form one peculiar class, but we shall here, according to their prevailing quality, assign them a place, either among those things which are friendly, or those which are hostile.

Between those things which shorten life, there is a difference still more important. Some act slowly, successively, and often very imperceptibly ; others, on the contrary, violently as well as suddenly ; and these may be rather named *the destroyers of life*. To these belong certain diseases, and the various kinds of violent death, as they are properly called. The latter, in general, are much more dreaded than the former, because their effects are more perceptible and more terrible ; but I can assure my readers, that they are at bottom much less dangerous than these secret enemies ; for they are so open that people can be much sooner on their guard against them than against the former, which carry on their destructive approaches in private, and daily steal from us some part of life without our perceiving it, though the loss in the end may amount to a sum truly alarming.

I must here make one melancholy remark, which is, that the enemies of our life have, in modern times, dreadfully increased ; and that the degree of civilization, luxury, refinement, and deviation from nature in which we at present live, by so highly exalting our intensive life, tends also to shorten, in the same proportion, our existence. We shall find on close examination, that men appear, as it were, to have anxiously studied how they might deprive each other of life secretly and imperceptibly, and often in the most ingenious manner possible. Much more precaution and attention are, therefore, now necessary in order to secure ourselves from danger.

DELICATE NURSING AND TREATMENT IN INFANCY.—There is no surer method of rendering the vital thread of a being from its origin short and perishable, than by giving it, during the first years of life, which may be considered as a continued generation and expansion, a very warm, tender, and

delicate education; that is, by guarding it from every breath of cool air; burying it for at least a year among pillows and blankets, and keeping it like a chicken in a real state of hatching; not omitting, at the same time, to stuff it immoderately with food; and, by coffee, chocolate, wine, spice, and such like things (which for children are nothing else than poison), to irritate it beyond measure, and to render its whole vital activity too strong and violent. By these means its internal consumption is from its birth so accelerated, its intensive life is so early exalted, and its organs are rendered so weak, tender, and sensible, that one may assert that, through two years' treatment of this kind, an innate vital capacity of sixty years may be reduced one-half; nay, as experience unfortunately shows, to much less, without reckoning those evil accidents and diseases which may besides be the consequence. The premature expansion of our organs and powers is by nothing so much hastened as by such a forced education; and we have before proved what an intimate connection there is between rapid or slow expansion, and a longer and shorter duration of life in general. Speedy ripening carries always along with it speedy destruction.\* This, certainly, is one great cause of the dreadful mortality which prevails among children. But men overlook those causes which lie nearest to them, and assume rather the most absurd, in order that their minds may be at rest, and that they may have as little to do as possible.

**PHYSICAL EXCESS IN YOUTH.**—As youth is the period of growth, of forming and collecting the powers of the future man, every kind of excess calculated to weaken or exhaust the vital powers should be carefully guarded against. There are certain active properties which belong to this period, such as muscular motion, which can hardly be carried beyond the

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\*One of the most remarkable instances of the prematurity of nature was Louis II, King of Hungary. He was born so long before the time that he had no skin. In his second year he was crowned; in his tenth he succeeded; in his fourteenth he had a complete beard; in his fifteenth he married; in his eighteenth he had gray hair, and in his twentieth he died.

bounds of health. But the excesses most to be dreaded are those which spring from a too early anticipation of the future man, in which the imagination and the feelings play a conspicuous part. Youth, it cannot be too often repeated, is the time for storing strength, both physical and moral; and every act which can in any way impede or frustrate this all-wise intention of Nature, will tend to lay the foundation of a weak and imperfect body, and shorten the days of its possessor. Among the passions of the future man, which, at this period, should be strictly restrained, is that of physical love; for none wars so completely against the principles which have been already laid down as the most conducive to long life; no excess so thoroughly lessens the sum of the vital power; none so much weakens and softens the organs of life; none is more active in hastening vital consumption; and none so totally prohibits restoration.

I might, if it were necessary, draw a painful, nay, a frightful picture, of the results of these melancholy excesses; but I refrain, in the hope that this simple caution will be sufficient. To my youthful readers I will simply say, *Be wise in time*. Experience may appear a harsh, but, nevertheless, she is a just monitor.

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## EFFECTS OF TOBACCO.

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The profession have no idea of the ignorance of the public regarding the nature of tobacco. Even intelligent, well-educated men, stare in astonishment, when you tell them that tobacco is one of the most powerful poisons we possess. Now, is this right? Has the medical profession done its duty? Ought we not, as a body, to have told the public that, of all our poisons, it is the most insidious, uncertain, and, in full doses, the most deadly. \* \* \* \* \*

It seems almost trifling with the subject, and yet the extreme ignorance which prevails regarding this frightful pest,

rendering even trifles weighty in the scale, induces me to remind all smokers, and those of our brethren who madly encourage it, that the first effect of a cigar on any one, demonstrates that tobacco can poison by its smoke, and through the lungs, just as certainly as through the stomach.

It is true, that the all-perfect laws of Nature point out to careless man, that he is taking in a poison, and by the sickness, headache, and vomiting which follow, stop for the time the poisonous dose, and avert the fatal end.

Look at the pale face, imperfect development, and deficient muscular power of the inhabitants of unhealthy malarious districts. They live on, but with only half the proper attributes of life. So it is with the habitual smoker: his system is accustomed to the poison; and so the opium-eater can take an ounce of laudanum for his morning's dram, and feel it not, when the eighth part of it would be fatal to the uninitiated.

What a blessing it would have been to mankind, if all men had shrunk from this plague of the brain, as did the first Napoleon. One inhalation was enough. In disgust he exclaimed, 'Oh, the swine! My stomach turns. It is a habit only fit to amuse sluggards.'

It is not, however, to be denied, that when the first poisonous effect has passed off, and the system begins to tolerate it, that tobacco acts as a slight stimulant to many organs. First to the brain, like wine and spirits in small quantities, or inflammation in its very earliest and very transitory stage, it excites to an unnatural degree the natural function of the part. I once knew a young clergyman, who could only write his sermons under the stimulus of tobacco, and there is no question that these discourses were brilliant, eloquent, and most interesting to listen to; but the end of that man is not yet come.

I have been asked to produce facts in proof of the deleterious effects of tobacco, and facts in abundance shall be forthcoming when I have had a record kept of its effects in my hospital cases; but the facts which I have now by me being private cases, contain details the relation of which would involve a breach of confidence which nothing would justify. No man likes to be held up as a victim of tobacco smoke, though

I could name many whose health has been decidedly injured by it. I have seen many cases of amaurosis, both in the incipient and advanced stage, caused by smoking.

I know a valued servant, in a family where I attend, whose memory was failing him, his face getting yellow, and his hand shaking; so that those who did not know him attributed his condition to drinking. He abandoned smoking, and in two years was an altered man.

For above ten years I smoked occasionally; and I am well acquainted with all the soothing, calming, and, for the time, agreeable effect of a cigar, or even short pipe. I left it entirely off about nine years since. This I did, because I believed it impaired my nervous energy; and I have every reason to be satisfied with the change. Since that time my attention has been uninterruptedly directed to the question—Is tobacco smoking positively injurious? The conclusion, therefore, which I have briefly given to the world through your pages, has not been hastily or capriciously formed on a few isolated facts. For the last twenty years I have been the medical examiner of various insurance offices—the Royal Exchange, the Victoria, the Crown, and New Equitable. The two former I still hold. In my examinations, I inquire whether the examinees are in the habit of smoking; and I can now generally tell by the countenance whether they are or not habitual smokers. If I have any doubt on this point, an examination of the fauces decides it. The fauces of the smoker are always more or less injected and rough, presenting the appearance of a piece of dirty red velvet, instead of the pale, pinkish, lilac hue of a healthy throat. The tongue, when smoking is not combined with drinking spirits, as is seldom the case in the upper and middle classes, is usually furred and white, but not otherwise unhealthy. This condition of the fauces may be produced by, and always accompanies the intemperate use of, intoxicating liquors; but then the tongue is unnaturally red; the papillæ at the tip and gustatory papillæ prominent and angry. The condition of the fauces is well worthy the attention of the profession; let them notice it, if possible, in almost every patient that comes before them, and they will soon be struck

with the correct index these parts afford of the habits of their possessors. \* \* This condition of the tongue and fauces is not limited to the mouth; it is not a mere local congestion; it exists, more or less, in the stomach, and the rest of the alimentary canal; and hence, I believe, in the otherwise healthy subject, a cigar acts as a moderate purgative, but in typhus as a poison. Can, however, any medical man assert, that it is natural or healthy to take an aperient daily? In the habitual smoker the heart is irritable, and the person nervous; the pulse frequently intermittent, and irregular in force and frequency.

In the course of my practice I have met with many individuals who, like myself, have abandoned smoking, because they thought it did not agree with them. Many have done so at my suggestion. I have never found one who does not assert, most positively, that he has been in better health since, and that his intellectual activity has been increased. \* \*

I may be mistaken, but I believe that all our greatest men—I mean intellectually—statesmen, lawyers, warriors, physicians, and surgeons, have either not been smokers, or if smokers, that they have died prematurely.

My friend, Mr. Whitfield, the resident medical officer at St. Thomas's Hospital, speaks most strongly of the injury he has witnessed from habitual smoking, his experience extending over above forty years, in a hospital containing nearly 500 beds, and relieving some thousands of out-patients every year. He has seen three cases of delirium tremens induced by tobacco smoke alone. In none of these cases had the patients indulged in drinking intoxicating liquors, so that there was no doubt of the single cause of the disease.—*Mr. Solly, Surgeon of St. Thomas's Hospital, in the Lancet, Lond., Eng.*

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“The gods are just, and of our pleasant vices  
Make sins to scourge us.”



RULES FOR PREVENTING THE SPREAD OF  
CONTAGION.

The following rules, from the experience of Drs. Ballard and Budd, are valuable in the preventive management of small-pox, scarlet fever, enteric fever, and all contagious diseases :—

Remove from the sick apartment all superfluous woollen or textile matters, such as carpets, curtains, and anything of that nature which are known to be retentive of disease-germs.

Measures of disinfection should be used as early and as thoroughly as possible. Carbolic acid in solution, or as carbolate of lime, is especially useful, to sprinkle on the floor, and with which all parts of the room may be washed prior to cleansing and limewhiting; and all articles to be washed ought to be soaked first in a solution of carbolic acid.

A basin charged with chloride or carbolate of lime, or some other convenient disinfectant, is to be kept constantly on the bed for the patient to spit into, and which must be emptied and replaced at regular intervals.

A large vessel (a tub) containing water impregnated with Condy's fluid or carbolic acid solution should always stand in the room (or near by), for the reception of all bed and body linen on its removal from the person or contact with the patient.

In place of using pocket-hankerchiefs, use small pieces of rag for wiping the mouth and nose, so that each piece, after being used, may be at once burned.

Two basins, one containing Condy's fluid or carbolic solution, and another containing plain soft water, and a good supply of towels, must always be ready and convenient, so that the hands of nurses may be at once washed after they may have been soiled by specific excreta. The dresses of nurses and attendants should be of linen, or smooth washable material.

Glasses, cups, and other vessels used by or about the patient, are to be scrupulously cleaned before being used by others.

The discharges from the bowels and kidneys are to be received, *on their very issue from the body*, into vessels charged with disinfectants.

To prevent the minute particles of desquamation from flying off as impalpable powder, their power for evil must be destroyed *in situ*, by anointing the surface of the body (the scalp included) twice a day with olive oil. It may be slightly impregnated with camphor, which Dr. Budd considers sufficient, or carbolic acid. The process relieves the itching of the skin, and is very soothing to the patient. So soon as efflorescence is observed on the skin of the neck and arms (as early sometimes as the fourth day), which marks the first liberation of the germ-carriers of the specific disease poison, the employment of the oil is to begin, and ought to be continued until the patient is well enough to take a warm bath, in which the whole person (scalp included) is well scrubbed, carbolic acid soap (Calvert's or Macdougall's) being abundantly used during the process. These baths are to be repeated every second day until four have been taken, when, as far as the skin is concerned, the disinfection may be regarded as complete, although a further quarantine of a week may be advisable.

The chamber in which the sick person has been must now be thoroughly washed out, using freely carbolic acid and soft or black soap (which may now be got combined for the purpose).—*Aitkin's Science and Practice of Medicine.*

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Dean Swift thus poetically portrayed the condition of London after a shower, A.D. 1700:—

“ Now from all parts the swelling kennels flow,  
 And bear their trophies with them as they go ;  
 Filths of all hues and odors seem to tell  
 What streets they sailed from by their sight or smell ;  
     \*     \*     \*     \*     \*     \*     \*     \*  
 Sweepings from butchers' stalls, dung, guts, and blood,  
 Drowned puppies, stinking sprats, all drenched in mud,  
 Dead cats and turnip tops, come tumbling down the flood.”

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## LIFE, HEALTH, AND DISEASE.

From a very early period, philosophers have been more or less constantly endeavouring to ascertain the precise nature of life. Many theories have been advanced regarding it, not one of which, however, has proved satisfactory. We know, indeed, but little, if anything, of the nature of that principle or force which can, with such apparent spontaneousness, elevate, so to speak, the simple inorganic elements of which our bodies are composed, into living, acting organisms; which can transform amorphous combinations of elements into the textures of plants and animals, and build up with these textures, organs and complicated living bodies, in such infinite variety.

About all that we know regarding it is, that in all living bodies there is a continued succession of actions, of combinations and decompositions, a constant building up and pulling down; a continued rejection of old material and appropriation of new. This ceaseless round of actions, this ever disorganizing and reorganizing, is essential to our existence, and is called life.

By Professor Huxley, the human body has been aptly and beautifully compared to an eddy in a river, which may retain its form for a great length of time, "though no one particle of the water of the stream remains in it for more than a brief period." Living organisms have been compared to the flame of a lamp, "which presents for a long time the same aspect, being ceaselessly fed as it ceaselessly wastes away."

Life is not a condition of stability, a power possessed by plants and animals enabling them to resist Nature's laws: it

is rather preserved by, and is subject in a high degree to those laws. Certain compounds of matter, under certain influences, or in co-operation with certain physical and chemical forces, manifest phenomena of life.

Many of these phenomena may be accounted for on chemical or physical principles. The digestion of food in the living stomach is but a chemical solution. The absorption of the dissolved food, and the changes effected in the blood by respiration, are the results of purely physical processes. Many actions of the nervous system are apparently due to simple physical changes in the nervous matter. And the generation of heat within the body is due to the same chemical changes which give rise to it in ordinary combustion.

Life is not manifested or maintained except under certain conditions and influences. A seed will lie dormant, perhaps for years, until brought under the influence of heat and moisture. Life is not manifested in the egg until heat has been regularly supplied. Heat and moisture are therefore in these cases the *essentials* of life: they are essential to the manifestation of the vital principle.

In the case of man, unless he is supplied with air, or some gas containing oxygen, for the purpose of breathing, all manifestations of life will immediately cease. Without water and food, he can exist only for a very short time. The essential conditions, therefore, for the preservation and continuance of life in man, are a supply of air, water, and food, each of which should be free from impurities, and abundant or appropriate in quantity. Furthermore, in order that there may be healthy and vigorous action in all parts of the body, and life be prolonged, there are other important essentials, which demand attention, such as exercise, rest and sleep, sunlight, suitable clothing, and cleanliness or bathing. The great vital functions of the system are dependent upon these essentials or agencies, and if the supply of any of them is deficient in quantity or deteriorated in quality, more or less functional derangement will be speedily produced, and actual disease will soon follow.

As has been intimated above, then, there are, as it were, two departments carried on in the body at the same time—

the Destructive and the Constructive; and upon the perfection, harmonious action, and vigor of these, depends that sublime condition called HEALTH.

Health is that active and unimpeded renewal of the body, and prompt elimination of worn-out substances, which give rise to the highest development of life in every part. The perversion, obstruction, or partial cessation of the vital processes constitutes disease.

Dr. Chambers, of Edinburgh, says: "The most active renewal of the body possible, the highest possible development of life in every part is Health. The complete cessation of renewal is Death. The partial cessation, or arrest, is Disease. In death, the flesh goes on being decomposed as during life; but, not being renewed, the form is lost entirely. In disease, decomposition goes on, but life, or renewal, flags, and the decomposing, wearing-out tissues are not properly pushed out by newly-formed substance. They are retained as part of the imperfect body—a sort of 'death in life'—and are rightly termed by the pathologist 'degenerate.' They are generated, but not re-generated; they are generated in an inferior mould of form."

There are many phenomena which are commonly regarded as disease, and as symptoms of disease, which are instituted by the inherent powers of the system to rid itself of something which interferes with perfect and harmonious action—of some cause of disease; such are reactions and fevers.

In remote ages, disorders of the human organism were believed to be due to the agency of evil spirits; and although these superstitions have long ago disappeared, many still regard diseases as things possessing a positive, independent existence, as entities, as something to be removed or thrust out of the system by medicines, instead of negations—instances of morbid action, of deficiency of vital activity.

Man is an organized being of the highest complexity, and his organization is therefore exceedingly liable to derangement from many and various causes, all more or less directly connected with the agencies or essentials of life. But by means of the power which a knowledge of the exact relations of these

agencies to the animal economy confers, he has very great control over the causes of disturbed health. And hence, we have to a large extent in our own hands, as it were, the power to prevent disease and prolong life.

Happily, it is much easier, much less knowledge is required, to take care of and preserve the health, than to regain it when lost; and almost every one may, without great difficulty, learn how to avoid most causes of disease: although, when the vital mechanism has once become seriously deranged, the most profound skill, the most extended knowledge and experience, may be required to set it right again.

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### PREVENTABLE DISEASE.

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The amount of preventable disease—of disease the causes of which may be readily removed by sanitary administration—the waste of human life, is as needless as it is appalling. Providence is often charged with the infliction of calamities which are entirely the result of our own folly. The majority of diseases are the products of our own imprudence or ignorance. Regarding preventable disease in Great Britain, Mr. Simon writes:\*

“It seems certain that the deaths which occur in this country are fully a third more numerous than they would be if our existing knowledge of the chief causes of disease were reasonably well applied throughout the country; that of deaths, which in this sense may be called preventable, the average yearly number in England and Wales is about 120,000; and that of the 120,000 cases of preventable suffering which thus in every year attain their final place in the death-register, each unit represents a larger or smaller group of other cases in which preventable disease, not ending in death, though often of far-reaching ill effects on life, has been suffered. And while these vast quantities of needless animal suffering, if regarded merely as such, would be matter for indignant

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\* Report of the Medical Officer of the Privy Council.

human protest, it further has to be remembered, as of legislative concern, that the physical strength of a people is an essential and main factor of national prosperity; that disease, so far as it affects the workers of a population, is in direct antagonism to industry; and that disease which affects the growing and reproductive parts of a population, must also in part be regarded as tending to deterioration of the race.

"Then there is the fact that this terrible continuing tax on human life and welfare falls with immense over-proportion upon the most helpless classes of the community; upon the poor, the ignorant, the subordinate, the immature; upon classes which, in great part through want of knowledge, and in great part because of their dependent position, cannot effectually remonstrate for themselves against the miseries thus brought upon them, and have in this circumstance the strongest of all claims on a legislature which can justly measure, and can abate, their sufferings.

"There are some indirect relations of the subject which seem to me scarcely less important than the direct. For where that grievous excess of physical suffering is bred, large parts of the same soil yield, side by side with it, equal evils of another kind; so that in some of the largest regions of insanitary influence, civilization and morals suffer almost equally with health. At the present time, when popular education (which indeed in itself would be some security for better physical conditions of human life) has its importance fully recognized by the legislature, it may be opportune to remember that, throughout the large area to which these observations apply, education is little likely to penetrate, unless with amended sanitary law, nor human life be morally raised while physically it is so degraded and squandered."

The above remarks are, no doubt, for the most part, as applicable to the Dominion of Canada as to England and Wales. The avoidable causes of disease are here very numerous; and it is highly probable that the death-rate is one-third, if not one-half, or even two-thirds, higher than it would be if complete sanitary measures were carried out by communities and by individuals—if the laws of health were reasonably well obeyed by every one.

Intemperance, as well in eating as in drinking spirituous liquors, the breathing of foul air and the use of impure water, chiefly from the accumulation of refuse matter about our dwellings, over-crowding and insufficient ventilation, defective drainage, neglecting the use of means for preventing the spread of contagion, the use of tobacco and of improper food, inaction and over-exertion, both mental and physical, uncleanness, exposures, certain trades and occupations, early and injudicious marriages, immorality and licentiousness, are removable causes of a great amount of needless human suffering, and a direful number of premature deaths,—filling our grave-yards much more rapidly than need be.

A large amount of preventable disease is attributable to social and individual causes, which legislative measures, health by-laws, or ordinary sanitary precautions cannot reach, and the hope of amelioration, so far as these causes are concerned, must depend upon education, general and wide-spread; as Dr. George Wilson truly observes, “the fundamental principles of personal and domestic hygiene must become matters of intelligent conviction amongst all classes, and especially amongst the upper and middle, that they may help those of the lower who are unable to help themselves.” But a large proportion of removable causes of disease comes within the scope of sanitary authorities or health officers of municipalities, upon whom has been conferred, to a limited extent, the power of removing such causes. The trust is one of life or death to thousands, and it is to be hoped it will be faithfully fulfilled, and that their duties will be discharged “without fear, favour, or affection.”

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Dryden's view of the origin of the art of medicine:—

“The first physicians by debauch were made;  
Excess began, and sloth sustains the trade;  
Better to hunt in fields for health unbought,  
Than fee the doctor for a nauseous draught.”



## BENEFITS OF SANITARY MEASURES.

Numerous and impressive examples of the benefits of sanitary measures are upon record, and volumes of statistics might be compiled to show the advantages of their application. It is well known that the medical profession has in the past been engaged for centuries in seeking in vain for effectual remedies for certain diseases which almost totally disappeared soon after the application to them of hygienic principles. Of this, the *scurvy* furnishes a good example. Regarding it, Dr. Youman's observes:—"Instead of inquiring into the conditions of its origin, and seeking means of prevention, the medical profession was for hundreds of years engaged in ransacking nature, with the hope of finding something that might prove an effectual remedy. This was sought in vain until attention was turned to its cause, which was found to consist in a lack of vegetable food, and the simple precaution of furnishing it has been the signal for the almost total disappearance of the disease."

In twenty-five towns, in England, examined a few years ago by Dr. Buchanan, it was found that the cholera had been "rendered practically harmless" by the adoption and carrying out of a complete system of sewage, for the removal of excrement; thus purifying both the air and the water. In some of these towns the general death-rate had been lowered over 20 per cent.; while in nine of them, the number of deaths from enteric or typhoid fever was diminished over 50 per cent., and in ten others, from 33 to 50 per cent.

In a report of the Army Sanitary Commission, published in Great Britain in 1858, it was proved beyond doubt that the excessive mortality from consumption among the soldiers, was due to over-crowding and insufficient ventilation. When the cubic space allowed per man in barracks was increased, upon the recommendation of the Commission, and the ventilation improved, the number of cases of this disease very materially diminished.

Similar evidence has been afforded by statistics of the Royal Navy, and likewise as regards the civil population.

## TYPHOID OR ENTERIC FEVER.

The increasing prevalency of enteric fever gives rise to a very general and proportionately increasing interest respecting its origin and development. A great deal of discrepancy of opinion appears to exist regarding the etiology of the disease, much of which is probably due to the difficulty in diagnosing the different forms which it assumes. Its origin is evidently in some way closely connected with what are commonly called sewer-gases, the effluvia generated in sewers, cesspools, and such like places, by the decomposition of organic, especially of fæcal organic, matter. Chief amongst these gases are carbonic acid, sulphuretted hydrogen, light carburetted hydrogen, ammonium sulphide, and nitrogen. The peculiar foetid smell of sewer-gas is owing to the presence of organic effluvia, the precise chemical composition of which has not been determined. Sewer-air from badly ventilated drains sometimes escapes into dwellings through defective traps, and though it may not be appreciable to the sense of smell, its baneful effects are none the less felt. It may in like manner find its way into cisterns, and be absorbed by the water; while decomposing effete matter may soak into the earth and penetrate into wells.

But whether the disease may be produced anew by inhaling such effluvia, or by taking them into the system with the drinking water, or whether sewers, cesspools, and privy vaults are only the channels by which the specific contagium, as from the discharges of enteric patients, is propagated, is as yet an unsettled question.

There are many who do not believe in the communicability of enteric fever. Recent researches, however, tend strongly to show that, while it is sometimes generated *de novo*, it is a contagious and specific disease.

In summing up his evidence regarding its spontaneous origin, Dr. Murchison, a high authority, observes: "I readily admit that we cannot succeed in tracing every case of enteric fever to organic impurities. But if the disease can be traced to such causes in a few undoubted instances, it is reasonable to

infer that its causes are similar in all cases where it has a spontaneous origin. As already stated, the actual poison may, like the miasmata which give rise to ague, be inappreciable to the senses, or by chemical research. During the last four years (1858-1862), however, I have met with few examples of enteric fever which, on investigation, I could not trace to defective draining, the existence of which was occasionally unknown to the inhabitants of the infected locality."

An outbreak of enteric fever occurred at Croydon, in Surrey, England, a few years ago, which affected only the high parts of the town. The water was pure, and the drains and sewers were found to be in good order and properly trapped, *but not ventilated*. The light sewer gases accumulate in the most elevated situations, and, in unventilated sewers, find their way into houses, almost in defiance of traps. After the house-drains and sewers were properly ventilated, scarcely a case was known at Croydon. More recently, at the Orphan Asylum, Beddington, there was an outbreak of the fever, which was distinctly traced to the absence of outside ventilation for the house-drains; from these the gases escaped into the various parts of the building. At Eastbourne, about the same time, the fever was prevalent in the higher parts of the town. Here the ventilators were blocked with charcoal, and, as the waste-pipes of the house-cisterns communicated directly with the sewers, they became real sewer-ventilators inside the houses. A similar occurrence is mentioned as having taken place at the schools at Caterham.\* It is generally well known that it is believed by eminent authorities, that the serious attack of enteric fever which so prostrated His Royal Highness the Prince of Wales two or three years ago, was owing to defective ventilation of the drains at the house of Lord Londesborough, at Scarborough.

In August, 1869, there were six cases of well-marked typhoid fever, all severe, and one terminating fatally, in a street in Clinton, Massachusetts. On examination, it was found that the sewage from eighteen tenement houses and one large boarding house, situated in a space of twenty rods, "was

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\* *British Medical Journal*.

emptied into a ravine at the end of the street, and was there spread out upon a little plot of ground of perhaps a quarter of an acre in extent, where it remained on the surface, exhaling an offensive odor, which the prevailing west winds carried through the street, contaminating the air to a considerable degree." The corporation was notified, and the sewer was "continued to a distance from the house to a brook in the ravine, and not another case occurred after the extension of the sewer." (*Report of the State Board of Health of Massachusetts, for 1872, in the Sanitarian.*)

The following report of cases from Pittsfield, U. S., also from the *Sanitarian*, tends to prove that this disease may arise from yet more local causes.

"In August (1871), four cases and one death occurred among the charcoal burners, who live high up on the side of the Taconic range of mountains. They occupy two log houses, one perched on the steep side of the mountain, at a considerable elevation, commanding a very extended view to the south and east, and the other not quite so high, in a deep, dark gorge, between two summits. Each hut gives shelter to about sixteen men, women and children, who are crowded together like sardines in a box. The houses are internally clean, and are supplied with pure spring water.

"The first case of fever, a very virulent one, was a young girl living in the house on the open hill-side. \* \* \* In seeking for a local cause, I found that on the side of the house toward the mountain the window-sills were at the level of the ground, the house being partially underground at that side. Close to the house on this side, coming within a few inches of the wall, was a large stagnant pool, formed by the trickling of a small spring. Into this pool most of the house slops were thrown, so that a filthy pool stood four feet above the level of the floor, and almost running into the window. About the two doors, on the exposed side of the house, decaying vegetables and slops were thrown, but the spring from which drinking water was obtained, about three rods from the house, appeared not to be contaminated. The patient had not been away from home for more than a month previous to

her illness, nor had she in any way been exposed to other local agencies. Three weeks after she was attacked, three cases of fever appeared in the other house referred to, in the gorge. One died, the other two recovered.

"This house is wholly above ground, but slops were thrown out about the doors. In the second story, which is directly under the roof, with the floor level with the eaves, eight men slept, the room being about 24 x 12 feet. Daily communication was had between the two houses, which are about half a mile apart. These houses are about five miles from the village of Pittsfield, and two miles from any other dwellings. Fever was not prevailing in the valley, and the cases appear to me valuable and suggestive ones in considering the causes of typhoid fever.

"Another set of cases occurred in September in a part of Pittsfield called Coltsville, four miles east of the village. The settlement consists of a dozen houses, lying in a narrow valley along the banks of a rapid stream. For several years past fever has prevailed there every summer, and the cause has been a puzzle. The stream is rapid, its bottom stony, and it also contains considerable chloride of lime from the paper mill. \* \* \* One of the houses where a fatal case occurred was supplied with drinking water from a well close to the edge of the piazza. The well was loosely covered with boards, and all the house slops were thrown out immediately around, so that they must of necessity trickle down the well, and every rain must wash down a considerable quantity of filth. In addition to this, a barn yard four or five rods from the house, contained a very large pool of stagnant water, without any outlet, and covered with a thick layer of green slime. This pool, which is several rods in extent, has existed for several years. Persons driving past the house in the evening have complained of the offensive exhalations from this pool.

"Another house where a fatal case occurred this year and another last year, is supplied with water from a very old well, dug just at the edge of the barn yard, so as to supply both the stock and the house. In cleaning it out this fall, pieces of rotten wood and a dead toad were found in it. In

every other respect the premises were remarkably unobjectionable. The house adjoining this, in which another case occurred, was excessively filthy. We (the writer and a member of the town Board of Health) were satisfied from our inspection that the fever epidemics at Coltsville are the natural result of a neglect of local sanitary precautions."

Dr. Parks believes it to be clearly established that persons may contract enteric fever by inhaling the effluvia from enteric stools before they are properly disposed of, as by disinfection or otherwise.

According to Dr. William Budd, it seems highly probable that infection is much more certain when the poison is conveyed into the system by water than when it is inhaled with the air.

Sir William Jenner, one of the highest of authorities, observes, "*Solitary cases, outbreaks confined to single houses, to small villages, and to parts of large towns—cases isolated, it seems, from all sources of fallacy—and epidemics affecting the inhabitants of large though limited localities, have all united to support by their testimony the truth of the opinion that the admixture of a trace of fæcal matter, but especially the bowel excreta of typhoid fever, with the water supplied for drinking purposes, is the most efficient cause of the spread of the disease, and that the diffusion of the disease, in any given locality, is limited or otherwise, and just in proportion as the dwellers of that locality derive their supply of drinking water from polluted sources.*"

A few years ago, enteric fever was alarmingly prevalent in the town of Winterton, Lincolnshire, England. The town contained about 1,800 inhabitants, for the most part living in well-built cottages, and earning good wages; intemperance was rare, and there was little overcrowding. The situation of the town was healthy. Dr. Thorne, one of the Health Inspectors of the Privy Council, was sent to investigate the causes of the outbreak. At the date of his visit, 55 cases were under treatment, and 6 deaths had occurred within a few weeks. Regarding the causes of the fever, Dr. Thorne writes as follows: "The epidemic prevalence of fever at Winterton is undoubtedly

to be ascribed to the disgraceful state of the privies, cess-pools, ash-pits, and wells. With the exception of about six houses, where water-closets have been constructed, all the cottages are provided with privies, which are generally built of brick, and have an aperture at the side or back, through which they can be cleaned out. This aperture I found open in almost all instances, and the result of this is that the contents of at least half the privies in the town run out into the gardens, soak into the earth, and penetrate in many instances into wells, besides producing the most offensive odor. In addition to this, many of the tenants either throw their refuse and slops, including urine, into the yards outside their doors, or else they improvise a receptacle by digging in the ground close to the aperture in the privy wall. \* \* The wells are also in the immediate neighborhood. \* \* Given the existence of typhoid fever in a town, it is hardly possible to conceive of conditions more favorable for its spread than those existing in Winterton."

Behind a group of four cottages, Dr. Thorne found a well in great proximity to privies and pig-styes. The water from this was found to possess a disagreeable taste, and to contain a large quantity of organic matter. The inmates of three of the cottages used it, and had suffered greatly from the fever; while those living in the fourth used water from a neighbor's well, and had always enjoyed good health.

Dr. Thorne also gives an account of an epidemic at Texling, in Essex. Out of a population of 900, about one-third were attacked with enteric fever within a period of two months, and 41 had died. The village was situated on a porous subsoil, and excrement had been allowed to accumulate in badly constructed privies and manure heaps, or to lie indiscriminately on the surface of the ground. About ten days previous to the outbreak, after a period of prolonged drought, a great rise in the water-level of the wells was found to follow a heavy fall of rain and snow. The unprotected, shallow wells had received the washings of the filth-sodden soil; hence, the epidemic. (*Report of the Medical Officer of the Privy Council.*)

Dr. Ballard states, regarding an outbreak of enteric fever at Nunney, the causes of which he was sent to investigate,

“that it was brought into the village from a distant place by an individual whose evacuations, and those also of others attacked in the same and in the adjoining house, found their way into the Nunney brook, at the upper part of the village; that the fever spread in the village in consequence of the villagers habitually drinking the water of the brook thus contaminated, which water was still further polluted with the sewage of the village itself, containing, if not the actual excrement of the sick, yet certainly matters washed out of their soiled linen, and also more or less of their liquid evacuations; that at the time of my visit, actual excrement from cases of enteric fever was finding its way into the brook at a hamlet only half a mile above the village of Nunny.” (*Medical Times and Gazette, 1873.*)

As showing the advantages of the sewer system for the removal and carrying away of excreta, and also of a pure water supply, we give the following extract from a report of the Committee on Statistics of Typhoid Fever and Dysentery, appointed by the Medical and Surgical Society of Hamilton, Ont., as published in the *Canada Lancet* in April, 1874:—83 cases of the fever were reported, 12 of which proved fatal. “As regards the relation existing between this disease and the water and drainage accommodation, it will be observed that only three cases occurred in places favoured with the public sewer and with city water; and as about one-sixth of the city is drained, and this portion supplied with city water, the immunity gained by these means cannot be over-estimated. This fact is more apparent, however, when we consider that only three cases occurred among a population of 5,000, taking the population of the city at 30,000, or one in 1,600; whereas 80 occurred among the 25,000 not favoured with sewers, but the majority of them with city water—that is. one in 312.”

What, then, are the inferences deducible from the foregoing facts? For the most part, the history of the outbreaks shows that enteric fever is a specific, contagious disease; that the contagium exists chiefly, if not entirely, in the intestinal excreta; that it may be communicated to the healthy through the agency of either air or water; and that water is most fre-



quently the vehicle by which the contagium is conveyed. The cases at Pittsfield, especially, indicate that the disease may be generated *de novo*, by accumulations of filth—of decomposing organic matter, as house refuse and excrement, especially in connection with stagnant water, in proximity to wells and dwellings.

The means of prevention, then, are obvious enough, both as regards the spontaneous origin of the disease, for it can scarcely be doubted that it may arise in this way, and likewise as to the propagation of the specific poison.

No excremental or refuse matter of any sort whatever should at any time be allowed to remain or accumulate near dwellings or the water supply, especially in towns and thickly populated villages. All such matters should be at once removed a safe distance in some manner, as by drainage or the scavenger's cart.

For rules applicable to the preventive management of enteric fever, see page 11 of this Journal.

With *proper precautions*, there is but little risk in such cases that the disease will spread, even to those who wait upon the sick.

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## DEFECTIVE DRAINAGE.

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Of all the preventable causes of disease, defective drainage is perhaps the most fruitful. It is a subject, therefore, which cannot be too frequently or too prominently brought before the public.

Defective drainage is said to give rise to nine-tenths of all the fevers that occur. The fevers most prevalent in undrained districts are those of a malarial type—intermittent and remittent, and in more southern latitudes, yellow fever. Numerous instances might be mentioned in which diseases of this sort almost entirely disappeared from such districts after the application of a complete system of drainage, although they had constantly prevailed for many years previous.

Dr. Buchanan, who has given much attention to this subject, states, in a report to the Privy Council, Great Britain, on the "Distribution of Phthisis (consumption) as affected by dampness of soil," "that wetness of soil is a cause of phthisis to the population living upon it." He found that whenever the drying of the soil had been effected by proper drainage, the mortality from consumption had decreased from 50 per cent. downwards.

Dr. Bowditch, of Boston, in an address delivered to the Massachusetts Medical Society, observes that, "Medical opinion in Massachusetts, as deduced from the written statements of resident physicians in 183 towns, tends strongly to prove, though perhaps not affording perfect proof of, the existence of a law in the development of consumption in Massachusetts, which law has for its central idea, that dampness of soil of any township or locality is intimately connected, and probably as cause and effect, with the prevalence of consumption in that township or locality."

Besides phthisis, and fevers of a malarial type, many other diseases, especially bronchial affections and rheumatism, are much more common in damp than in dry districts.

The terms drainage and sewage, as ordinarily understood, are entirely distinct in their application. Drains are for the purpose of removing water from saturated soil, and must be pervious along their course. Sewers are for removing and conveying to some proper outlet, a safe distance from human habitation, all excrement and refuse; and this as rapidly as possible, in order that the effects of the rapid decomposition of such matters shall not be experienced. They must, therefore, necessarily be water-tight, to prevent the escape of the contained sewage into the adjacent soil.

Districts of country, when in a natural state, present a surface diversified by hills and valleys, whose acclivities and declivities form water-sheds, at the lowest parts of which are water-courses or channels, along which any excess of water flows toward the sea. While a large proportion of the rainfall flows off in this way, and a small proportion is evaporated where it falls, a certain amount is utilized in the processes of

vegetable growth, and a considerable portion percolates through the soil, especially in flat districts, until it meets with an impervious substratum. Here it accumulates, and saturates the superincumbent soil, giving rise in some localities to swamps and marshes.

The saturated soil is chilled by evaporation, while the air in the locality is rendered humid; or perhaps during the warm seasons, by the process of decomposition or minute vegetable germination, malaria is generated.

No such locality can be healthy until it is thoroughly drained, and free and permanent outlets provided for all accumulated water, by means of a system of drains, superficial or deep as occasion may require.

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## OUR FUTURE GENERATIONS.

In the Toronto "Globe," a few days ago (June 27), in an article on "Health and Climate," appeared the following:— "We ought to build up a nation which in sheer physical stamina would be unsurpassed. Nor can anything prevent this being our destiny but softness, indulgence, luxury, and want of attention to the laws of health." There is not one probably, who would doubt the truth of the above extract,—doubt that we are at least able to build up such a nation. Nothing indeed need prevent but want of attention to the laws of health. "Our climate is wholesome," the atmosphere is clear and invigorating, and, with due regard, on the part of the people, to the matter of clothing—with the exercise of ordinary common-sense in meeting atmospherical mutation; with appropriate garments, as conducing to the development of a healthy, vigorous race, it is probably unsurpassable. Food is abundant, and well designed to give strength and endurance. And unless it be avarice or an ardent desire to become over wealthy, there is not anything to "grind down either mind or body."

But in order that future generations of Canadians may be as healthy, well-developed, hardy, and vigorous, mentally and

physically, as may be desired, it behooves us, of the present generation, to commence, as it were, at the beginning; to look after the health and development of the infants, children, and youths of the present age; to teach the young the value of health and the art of preserving it; to go back indeed still further, and awaken the attention of mothers to the necessity of giving heed to the health of their little ones while yet unborn.

In no other part of the world, probably, is the public so well protected from quackism in the healing art, so far as law can protect, as in Ontario. And to whom is the public indebted for this? To whom but to the medical profession? We would be glad to find the next effort on the part of the profession directed toward sanitary enactments. It could render valuable aid in still further improving and amending, or extending, our recent act respecting Public Health, and use its influence in favour of the establishment of a sanitary bureau, with relations to the General Government, similar to those of the other departments of the government.

The subjects of drainage and ventilation, especially, appear to admit of a certain amount of Legislation regarding them. Compulsory education appears to be in general favor, and only certain studies are permitted in the schools. But that prominence is not given to hygiene and to elementary physiology which these subjects appear to demand. What branches can be of greater importance? A limited amount of physical training, too—of gymnastic exercises—might be practised in schools with great benefit. School-house ventilation is a matter which, as affecting the health and development of the young, is of the utmost importance, and too little attention is given to it.

To come to matters which enactments of the Legislature can hardly reach, we find the clothing of the young in many cases woefully defective: health is too frequently the sacrifice of fashion. The habits are irregular and effeminating; and the food is improper and unfitted to fulfil its physiological purposes. For improvements in these respects we must rely upon education, and not upon health by-laws. The family

physician may do much by advice and instruction, and we have no doubt much is assayed in this way; but his counsels are too often unheeded, or if not unheeded, not acted upon.

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## A NEGLECTED LUXURY.

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Almost all living nature bathes after some fashion or another: the cleansing and invigorating of the vegetable and animal kingdoms by the dew and the rain, are but modifications of the bath. Bathing was enforced as a religious duty by the Jewish and also by Mahometan laws; frequent ablutions were made to form part of their religious rites. Among the Greeks and Romans, bathing became a most luxurious pastime. In Russia, the vapor bath is in general use, from the Emperor to the poorest serf. Dr. Clark informs us that throughout all Finland, Lapland, Sweden and Norway, there is not a hut so destitute as not to possess its family bath, to which every member of the family resorts every Saturday at least, and every day in case of illness. The use of the bath is equally general in Turkey, Persia, and Egypt, among all classes, from the Pasha down to the camel-driver and Arab boatman.

How is it with the great Anglo-Saxon branch of the human family? Is it a hydrophobic propensity, or an inclination to economize time and water, that has with it so degraded ablution, that it is now so generally confined to the face and the hands? The exceedingly limited number of bathing-rooms in the entire Dominion of Canada, outside of the principal cities and towns, shows a marked and singular discrepancy between admitted theoretical knowledge and its practical application. Thousands of comfortable dwelling-houses are continually being built, in which apartments are appropriated to the various domestic processes, as cooking and 'washing;' while the setting apart of even a corner for the purpose of cleansing and invigorating the body, is apparently never once thought of by the builders. Let us hope and strive for improvement. Let us hope and strive to make the health-preserving practice of bathing the entire body as customary and universal as that of washing the face, or rising from bed in the morning.

## DISINFECTING CHAMBERS.

Every town should be provided with a hot-air disinfecting chamber for public use. Dry heat, if sufficiently high, is destructive of all organic matter, and consequently, of all infection. For articles which imbibe and retain contagious matter, such as bed and body clothing, it is superior to all disinfectants. The penetration of all others may be intercepted by folds of the material, but heat will find its way in spite of all obstacles. It has been found that the vaccine virus is deprived of its power of reproduction, or "taking," by being exposed for three hours to a temperature of 140° F.; though a temperature of 120° failed to produce this effect. The temperature for disinfecting clothing, bedding, etc., should exceed 200° F. or better, perhaps 250°; but it should not extend beyond 300°

The chamber is built of bricks, and is heated by hot air pipes, lying beneath a perforated iron grating, the floor of the chamber. The products of combustion pass into the atmosphere, but no emanation from the infected clothes can escape into open air.

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This number of the Sanitary Journal will be mailed to a large number of persons throughout the Provinces, and any of those who receive it, and who desire to become subscribers will please send their address to the "EDITOR SANITARY JOURNAL," Toronto.