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# THE SANITARY JOURNAL.

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GENERAL SANITATION—ITS IMPORTANCE TO THE PUBLIC  
WELFARE, AND A PLEA FOR BETTER METHODS.

BY HENRY B. BAKER,

Secretary of the Michigan State Board of Health.

*(Read before the Grand Rapids Sanitary Convention, February 18).*

*(Continued.)*

## HOW DO HARMFUL FERMENTS ENTER THE BODY?

In order to be able to guard us from the communicable diseases, the health officer should know the sources of danger, and the probable ways in which different diseases enter the body. Much remains to be proved in this field of study, but concerning certain diseases there is much that seems well established.

### TYPHOID FEVER.

There is good evidence that the greatest danger from typhoid fever comes from what goes into the stomach, and not from the air taken into the lungs, and that of all sources probably the most frequent is water contaminated with the discharges from persons who have had the disease, though an epidemic of about 200 cases in Germany has been traced to the eating of the meat of a calf which had probably been affected with the disease. The poison of the disease seems to be reproduced in the intestine and not usually on the outer surface of the patient. In typhoid fever, then, the health officer need not quarantine or isolate the patient, for it is not common to have the disease spread by breathing the same air in which the sick person is; but the health officer should carefully superintend some of the details in every case of typhoid fever. He should require the discharges from the bowels of the patient to be thoroughly

disinfected, and not permit them to go into any accumulation of excreta from which they may eventually return to plague the human race.

It had been thought that typhoid fever has sometimes been caused by breathing in the ferment given off from decomposing organic matter; and diarrhoeal diseases have been known to be caused in a similar manner, although it has not been demonstrated that the ferment was itself inhaled. Generally we have a right to assume however, from the evidence of observed facts, that wherever we find the odors of decomposition in connection with organic matter, there also are the special ferments of that particular decomposition, unless unusual circumstances have caused a separation; for the bacteria of decomposition are exceedingly minute, and their germs appear constantly to float in the air of foul places. The health officer should be required to search out all such places, and to abate any such nuisances. By means of lectures and circulars, and otherwise, he should interest all classes as to the best means of preventing the disease. If he prevents typhoid fever, he will prevent about five per cent. of all the deaths which now occur from all causes; and he will save his city from a great waste of life and money.

#### SMALL-POX.

Small-pox is now usually of little consequence, as it does not cause many deaths in intelligent communities, and its prevention is easy by timely vaccination and revaccination. But it is worth while to understand that its cause probably does not usually enter the body as does that of typhoid fever—by the mouth—but the special ferment is generally inhaled with the air we breathe. And the special ferment is reproduced on the outer surface of the patient. It is therefore important to isolate persons who have small-pox, and to destroy or disinfect not only the discharges, but everything which has been in a room with a person sick with that disorder. An active health organization in a city where people are generally intelligent, should, in this enlightened age, be ashamed to have an epidemic of small-pox. I am informed that in one city in this state, where there is a paper-mill, seldom a year passes that a case of small-pox does not occur, but the intelligent health officer generally restricts it to the first case, and has never had more than two or three cases in the outbreak.

## SCARLET FEVER.

Scarlet fever is a disease of much greater importance in this State than is small-pox. Whenever our health officers shall protect us from scarlet fever we will be spared a very considerable proportion of our present death-rate and a vast amount of suffering which now follows children through life, for scarlet fever leaves many who linger on through years of imperfect life. In this disease, as in small-pox, the special ferment seems to be reproduced on the outer surface of the body, perhaps, also in the throat and throughout the body, so that the discharges and everything which comes near the body should either be disinfected or destroyed.

## DUTIES OF THE HEALTH OFFICER IN CONNECTION WITH SCARLET FEVER, ETC.

The health officer should, next to the attending physician, be the first to visit the premises where scarlet fever occurs, and in the interest of the community should superintend and enforce measures for the restriction of the disease. The physician is employed and paid only for the benefit of the family who employs him. If the community expects to have its interests subserved, it must employ and pay some one to attend to them. The health officer should put up a notice to warn those who might otherwise enter into danger. He should leave with the family plainly printed instructions, and before he leaves he should make sure that the methods for the restriction of the disease are understood by the family. A city might even pay skilled nurses to remain with the sick, with a view to preventing the spread of the disease, than have such a disease as scarlet fever through the city with all the chances for its germs to remain for all time to come, to break out again whenever a sufficient number of children come to be of the most susceptible age.

## DIPHThERIA.

Diphtheria is another disease which is being allowed to destroy the children in this State, in some parts of the State, without any proper effort for its restriction. Its special poison is believed to enter the body by way of the mouth and air passages, and to be communicated by whatever comes in contact with the inhalations and excretions from the body of the sick person.

In the restriction of diphtheria, and of the other communicable

diseases, except small-pox, which can be modified or prevented by vaccination, there is a great and generally neglected field for active work by our health authorities, throughout the State, and in every year. About one-eighth of all the deaths reported in this State are reported as caused by the communicable diseases. Among these diseases few cause a less number of deaths than does small-pox, but, aside from vaccination, the methods adopted for its restriction are generally applicable to all the others, except, perhaps, typhoid fever, of which mention has already been made.

#### THE ECONOMY OF HAVING A HEALTH OFFICER.

The State Board of Health has the names and post-office addresses of over 3,500 physicians in Michigan. I think it is safe to estimate that the average annual income of these doctors is at least \$1,000 each; and, if so, the people of this State pay \$3,500,000 a year to those whom they employ to prescribe for the sick. If in respect to sickness, we admit that an 'ounce of prevention is worth a pound of cure,' one-sixteenth of \$3,500,000 judiciously expended in the prevention of sickness would be worth as much to the people as the whole sum spent for the cure of sickness; or, if the whole 3,500 doctors were employed and the whole \$3,500,000 expended in the prevention of sickness, the benefit to the people would be sixteen times as great as now and would have a money value of \$56,000,000. And yet not all the sickness is preventable. The debt of nature must be paid at last. When science has failed to prevent sickness the skillful physician can often aid in nature's efforts to recover strength, and when death is certain he can often make easier the last days of suffering. But can any rational person suppose for an instant that if one-sixteenth of the 3,500 physicians now employed in prescribing for the cure of disease were constantly employed and paid for their services, and their success in searching out and applying all possible knowledge for the prevention of sickness and deaths, it would require near all the remaining 3,282 physicians to prescribe for the sickness which would not thus be prevented? Can any one suppose that many of the present heavy burdens of the people would not be removed?

Omitting mention of the most important direct benefits of the prevention of sickness and noting only the indirect benefits not so frequently dwelt upon, let us think of the vast sums of money paid to

maintain poor-houses, hospitals, insane asylums, asylums for the deaf, dumb and blind, jails, and even prisons; much of this expense would then be entirely unnecessary; and many of the causes for demands now made for private charity would not exist; thus, as I believe, not only our personal expenses but our State, county and municipal taxes would be materially lessened, the prosperity of our people would be something wonderful when compared with our present condition, and the phrase, "life, liberty, and the pursuit of happiness," would have its first and last terms wonderfully emphasized.

There is no reason to fear that we should suffer for want of doctors, even if we were to ask everyone of those now practicing to change his employment to the prevention of sickness. If more were needed I think they would be forthcoming; but suppose every one of the 1,261 local boards of health in this State should constantly employ one physician as a health officer, there would still remain 2,240 doctors to attend to the sickness which the other third failed to prevent; and the 1,261 physicians who would then be constantly employed as health officers of local boards of health would cost for permanent salaries only a small part of the \$3,500,000 which is now estimated to be paid to physicians.

The main reason why we need an active health officer who understands his business, in every city, village and township, is that the people do not now seem to know the preventable nature of the diseases which kill them. In many places they stand by like dumb animals, and suffer their children to die of diphtheria and other communicable diseases, and never lift a finger to try to prevent the spread of these diseases. This apathy and ignorant or wilful disregard for human life is not confined to the rural districts, but is seen in cities.

#### PRACTICAL ILLUSTRATIONS.

In Detroit, the burials in the city cemeteries indicate that the deaths number about 2,000 in each year. Of this number, the deaths from diseases usually included among those which endanger the public health, and which therefore are both by the law and by sanitarians regarded as preventable, usually number about 240, which is twelve per cent. of the total deaths reported. And this does not include consumption, pneumonia, or diarrhœa, many deaths from which diseases I believe could be prevented. If we conclude

that under good effective sanitary work the sickness could be reduced by ten per cent., the 200 physicians of whom we have the names in Detroit might safely be reduced by that proportion ; and if the twenty doctors thus thrown out of employment were employed by the city in the work of general and special sanitation, I firmly believe that it would be in the direction of true economy for the citizens of Detroit. And when I plead for sanitary work, it is not for such work as may be done by a number of city physicians, whose duties are, first, to attend to their own private practice ; second, to attend to the sick poor within their jurisdiction. This is not general sanitation nor work for the prevention of sickness ; it is not even preventive medicine : it is the same old idea of trying to cure what should have been prevented ; it is like locking the stable door after the horse is stolen, and is frequently a waste of time and money, because the communicable diseases are generally as yet self-limited diseases, which run their course under any treatment, though such care as a skillful physician may prescribe may sometimes save life.

We have, as I have stated, the names of about 200 physicians in Detroit. I presume there are more than that number. Let us suppose that the 200 physicians have an average annual income from their practice of only \$1,000 each—then the citizens of Detroit pay two hundred thousand dollars a year to those who prescribe for cases of sickness. And yet we are officially informed that the Board of Health in that city has “ not met during the past year.” I suppose its motto on this subject may fairly be stated : *Two hundred thousand dollars for the cure of disease, but not one thousand for its prevention.* Under such circumstances, I do not wonder that the city is ashamed to publish a report of deaths and causes of deaths, and that we find it impossible to get such official statistics from Detroit, though we have no difficulty in securing such reports of the mortality in many of the principal cities in this and in other countries.

The health officer of Bay City is not a physician, as the law requires where this is practicable. He says there are in Bay City about forty physicians, that their annual incomes will average at least \$2,000 each. That is, the people of Bay City pay \$80,000 a year to physicians. Suppose 10 per cent. of those physicians were employed and paid by the city to labor for the prevention of disease, and held morally responsible for the occurrence of preventable diseases. Then

four physicians would be thus constantly employed, and paid \$2,000 each per year, thus diverting \$8,000 out of the \$80,000. Does any one doubt that this sum would be saved from the \$80,000 now necessary to be expended in paying physicians for the cure of sickness? Possibly it might not decrease the sickness 10 per cent. the first year, but I firmly believe that if continued it would be a paying investment in the end, for the physicians so employed would gradually become sanitarians; and in order for this to be a paying investment the first year, it is not necessary that the sickness be reduced by 10 per cent, because the doctor's fee is frequently only a small part of the expense of sickness.

In Detroit, in Bay City, in Grand Haven, and, perhaps, in other cities in Michigan, it seems to be considered too expensive to have a health officer and pay him, as should be done, two thousand dollars a year, and require his entire energies to be put forth for the prevention of sickness and deaths. I suppose that one reason for this state of things is that to have a health officer requires some action on the part of city officials, and, perhaps, a vote to pay him his salary, while it is possible, for instance in the city of Detroit, to permit the people of the city to pay \$200,000 a year for physicians without any official action whatever.

We understand very well that there are taxes which come by assessments because of official action—it may be well for us to understand that there are also heavy expenses which may sometimes come upon us without official assessment, and even because of neglect to provide for assessments to prevent such heavy expenses.

In my plea for better methods I refer to the expense for physicians only, for purposes of illustration, because it is for personal services somewhat analogous to those which would be given by a health officer, and because the facts are easily obtained and their bearing easily understood. I do not see how a rational person can examine the facts, and not be convinced that at least one skilled physician and sanitarian should be constantly employed as a health officer in every city and village in the State, and from time to time in every township.

“KNOWLEDGE IS POWER.”

Never yet has the public health service of Detroit, Bay City, Adrian, Jackson, or indeed of any city in Michigan been properly or-



ganized for effective and complete work in all branches of the service. The vital statistics of the city, which lie at the very foundation of effective public health service, have never been properly collected. No tables carefully compiled under the immediate supervision of a medical man or vital statistician are regularly published by any city in Michigan. Without such means of knowledge respecting the particular sources of danger to life in Detroit, or in any city, it is not probable that the city will ever have the most effective sanitary work. Knowledge is power, in sanitary work as in other pursuits, and the most effective public health service is based upon accurate knowledge of the sources of danger to life and health within the jurisdiction of that service. Complete statistics of deaths, where obtained, supply the knowledge of relative danger to life from each recognized cause of death ; and such statistics, properly studied in connection with other facts, also lead to a knowledge of many causes of death not previously known, and which cannot otherwise be ascertained.

#### FOR SUCCESSFUL GENERAL SANITATION

it is only by organized effort that the best success is attained ; what is needed in this city, and in every city, is that the comparatively few who really appreciate the very great importance of this work shall strongly co-operate and be active and energetic in intelligent efforts for the proper organization and work of the public health service. It is a subject which deals with questions upon which our very lives depend, and is so far above all the usual questions of party politics that all good people should unite to select and retain the very best men it is possible to secure, and to see to it that such men shall be supplied with the money and support necessary to properly maintain an effective health service. We should remember that the most severe tax to pay is the "debt of nature," and next to that the heavy tax which sickness always entails, and in one way or another forces the collection. These considerations are too often lost sight of by "penny wise and pound foolish" city authorities who grudgingly dole out a few dollars, and sometimes fail to do even that, for the use of the city board of health, the most important organization in the city, and one on whose proper action depends the health, life and happiness of the people who pay the taxes ; for, although the sickness from preventable causes is usually most severe

among the poor and ignorant, communicable diseases are no respectors of persons, and the poorest resident of a back alley may be able to give to the richest citizen the most loathsome, fatal, or rapidly-spreading disease. As "the strength of a chain is the strength of its weakest link," so the health and strength of the people or a community may depend upon the health and strength of its weakest members. In these times of rapid communication among people throughout the world, and close relations of members of communities, no man can live for himself alone ; but, whether he knows it or not, he has a vital interest in the health and prosperity of his fellow beings.

#### MISSIONARY SANITARY WORK.

After the student in sanitary science has mastered so much of the physical, medical, social and other sciences as to enable him to be of real use to humanity in his particular sphere, his usefulness will then be somewhat in proportion to his ability to impart the results of his research, experience, observation and study. Therefore one of the most important parts of the work of the leading sanitarian is now, and it seems to me must always be, somewhat akin to the missionary work done by the clergy. The leading sanitarian must first labor until he is convinced that he has gained a part at least of nature's eternal truth, and he must then rouse people to an appreciation of the direful consequences of their own transgressions ; he must point out the better way of life, while he denounces most of the old ways as sinful, degrading, and leading down to death and destruction. Stated in this way, it really seems that the work is a noble one, because intended to advance the best interests of mankind—to promote health and happiness among the people. Perhaps it is for this reason that the sanitarian is so often forced to carry his cross ; because we have still with us many people who can persecute the apostle of science in ways which cause pain if not death. People do not seem to like to have their transgressions of sanitary laws pointed out to them. This brings me to consider some hindrances to sanitary progress.

A case of small-pox occurs, and to avoid a panic or loss of custom to a few merchants and others, the truth is suppressed, the people are not warned that they must be vaccinated, and an epidemic of small-pox occasionally results. Scarlet fever breaks out, but no

active board of health has educated the people in the requirements of the law for prompt notice of such diseases, and it is a long time before the board of health receives such "official" information of the outbreak as to be stirred to action; meanwhile many families have buried their loved ones—dead of that disease so dreadful to parents. Diphtheria finally comes. It had prevailed in neighboring places for a long time, but the members of the board of health have not investigated the subject—some of them do not know that it is a communicable disease, and exceedingly dangerous to the public health, though they know that the deaths occur mostly among the children. Many of the doctors call mild cases by other names. Nothing is done to stop its spread, and very soon there are so many sources that it is impossible to trace the spread of the disease by contagion, and the city has one more disease fastened upon it, perhaps for all time to come, though the disease may occasionally die down *for lack of material*, only to spring up again on the opening of the schools in autumn, after more children shall have grown up to the most susceptible age.

#### MONEY VALUES OF THE MOST IMPROVED SANITARY METHODS.

M. Jackson S. Schultz, of New York, has lately said that "from 1822 to 1840, during the summer months, no business could be done in hides and rags," because of the nature of the quarantine, which, however, was the best known at that time; that "the loss to those engaged in commerce and manufacture requiring those articles, must have been at least \$100,000,000—a sum sufficient to sustain all the health boards in the country." *Now* the quarantine is so managed by experts as to occasion little interruption to commerce or manufactures. He said, "If these trades should be again stopped, it would pay them to establish schools and hospitals for the education of doctors for sometime to come." Perhaps he meant the education of sanitarians or health officers. He is not a physician, but said he spoke "from the point of view of the tradesman." His statements show that *after sanitary progress has been made*, its importance is recognized by some classes of people. It is to be hoped that the time will soon come when all classes of people can realize the importance of *aiding its progress*.

If an improved quarantine system in New York is worth \$100,000,000 in eighteen years, simply to the business connected with

hides and rags, then certainly better methods of sanitation which are applicable to all kinds of business interests throughout our State, must be of very considerable importance to the people of this State. Because whenever a prominent communicable disease, such a diphtheria or scarlet fever, breaks out in a place, business interests are certain to suffer; and in spite of, and perhaps because of attempts to suppress the knowledge of the outbreak of a communicable disease, the disease frequently spreads and finally injures the business of a place far more than it would have done had the case been promptly reported to a board of health, whose known efficiency would be a guarantee that the disease would be at once suppressed.

#### RELATION OF SCHOOLS TO PUBLIC SANITATION.

Business interests in relation to this subject are great, but educational interests are probably greater, at least to the rising generation which is soon to displace us. Under present imperfect methods there seems to be no escape from one of two evils—either the schools continue and spread scarlet fever, diphtheria and other communicable diseases throughout cities and throughout the State, as they are now spreading diphtheria; or the schools are closed, and though the public health, which is of the greatest consequence, is furthered thereby, the whole educational work is for the time broken up. What is worse, this breaking-up process must come still more frequently as time goes on, unless some improved methods are adopted; because modes of intercommunication are becoming more complex. Under present methods the schools are not closed promptly on the outbreak of a communicable disease, but only after the disease is quite general, and as the germs of these diseases remain active for quite a long time, whenever the schools open, at least in the autumn, there is likely to be some pupil prepared to communicate one or more of the infectious diseases.

For the best interest of the schools and for public health, we need an entirely different sort of work from what we now have, a much more thorough, systematic, continuous and rational support of our present laws, which seem to be a long way in advance of the knowledge or practice of the people. Suppose that, instead of suffering as we do, a very considerable proportion of the children sent to school to die or suffer through life from the results of disease contracted in school, or instead of breaking up the schools every year

or so, and losing the entire benefits of the school for a considerable time, we were to employ constantly a few experts to do away with both these evils. To me this seems just as practicable as was the improved quarantine in New York City, if only our people will unite in the work. I suppose that the quarantine system of New York City costs about \$100,000 a year; and we have seen that a tradesman estimates the annual saving to only a few trades to be millions of dollars.

#### HOW CAN THE SCHOOLS GO ON WITHOUT DISSEMINATING DISEASE?

Let us consider some of the work which needs to be done in order that the schools may go on continuously and yet not spread disease.

The three most important general principles of action by the improved New York quarantine are: Isolation of the sick, disinfection of all infected material, and ventilation of everything. In order that this shall be possible in relation to the schools of a city, it is essential to have such a thorough organization of the health authority of a city that suspected cases of communicable disease shall be promptly reported to the board of health and be immediately visited, and the truth learned whether or not the case is one involving danger to the community. The health authority must be given money sufficient to have such work done with as much promptness as the fire department display in visiting the locality of a reported fire; and as the firemen remain until the fire is out, so the health department might have its officer or employe remain until the disease is over. He should watch and guard the public safety. He ought to use disinfectants skillfully, and, if need be, as freely as water, until all danger of a fresh outbreak should be prevented. He should see to it that in no way does the disease spread. Now we quarantine all, sick and well, by closing the schools. An active health department should at all times have as perfect knowledge of the location of cases of diseases which endanger the people under its protection, as the fire department does of the buildings which are burning and thus endangering the property under its protection. With such knowledge as this the health department could furnish the teacher of every school in the city with a list of all families in which there was a person sick with a communicable disease, and, if necessary, an agent of the health department, or some other person, could act as sentry at each school, and persons liable to communicate disease

could be kept out. As an additional precaution, even where there has been no known infection, all articles likely to convey disease into the school could be easily disinfected, if it were only a custom to do so and provision were made for such disinfection. It would be easy to have a small room at every school-house where the outer wearing apparel, etc., could be disinfected and aired while the wearer was in school, instead of having, as is now so commonly the case, the clothing of all closely packed in an unventilated closet.

#### GENERAL BOARDS OF HEALTH.

Some one may question why, in this paper on general sanitation, so little is said about general boards of health—State and National. It is not because such boards are not of exceedingly great importance, for in my opinion they are essential to successful general sanitary work, but because they are further removed from the people for whom this paper is intended, and because of the truly democratic character of the health laws of this State, their theory and underlying principles being that

#### LOCAL NUISANCES SHOULD BE DEALT WITH BY LOCAL AUTHORITIES.

This principle seems to me to be so manifestly sound that it is unnecessary to dwell upon it ; but inasmuch as it is so frequently overlooked, it seems necessary to mention it briefly : The laws of this State give to local boards of health almost absolute power over everything relating to the restriction and prevention of diseases, the abatement of nuisances, etc., and no such powers are given to the State Board of Health, which has duties no less important, but of a different character. It will thus be seen that local boards of health are justly responsible for preventable

#### SICKNESS WITHIN THEIR JURISDICTION.

As the local boards of health which have this absolute power, and consequent responsibility, are composed of just the men whom the people of each locality choose to have act as the guardians of their lives and health, it seems evident that no progress can be made except the people themselves shall in some way make progress in sanitary knowledge ; and as it would be very much like requiring a man to raise himself by his boot-straps to expect that the greatest progress can be made without some outside aid, the laws of this State make provision for the utilization of the best work and experience of each

and every local board for the benefit of all the other boards, through a system of annual and special reports to the State Board of Health, which is charged with the duty of collecting and disseminating all sorts of useful information on the causation, prevention and restriction of diseases and deaths.

It may thus be seen that though the State Board collects useful information from all possible sources, it is more or less dependent upon local boards for material to compile, collate and utilize for the general good; and its work in diffusing information, and in other directions, is advanced by whatever advances the general activity and usefulness of the local boards. We have seen that the local boards are what the people make them. So that what is most essential to progress in public health and consequent prosperity is general progress in sanitary knowledge among the people. To those good people in Detroit and Grand Rapids who, with this object in view, have made these Sanitary Conventions possible and successful, are due our thanks and the thanks of all citizens.

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#### SANITARY REWARDS AND PUNISHMENTS.

READ BEFORE THE MICHIGAN SANITARY CONVENTION, DETROIT, JANUARY 1880, BY HON. HENRY W. LORD.

Scientifically there are no sanitary rewards and punishments, in the sense in which I may use those terms. I therefore commence this paper by striking out its title.

An oak favorably situated, and year by year rising and spreading upward, availing itself of all accessories to its growth, until it arrives at ideal perfection, under the operation of natural rules of order, cannot be said to be the recipient of sanitary rewards, nor can one adversely placed, making such progress as it may, with obstacles to encounter that stunt and deform its growth and abridge the duration of its life, be said to be the subject of sanitary punishments. The one flourishes in conformity to law with resources available, and the other suffers by alienation from necessary conditions or deprivation of support.

Something like sanitary rewards and punishments, however, result from the observance or violation of sanitary laws; but as rewards and punishments involve of necessity a consciousness of right and wrong on the part of the recipient, as well as a discrimination on the

part of the power whence rewards and punishments emanate, and as it is maintained in this paper that sanitary penalties are inflicted and sanitary advantages achieved without the least regard to the moral qualities of the conduct that leads to them, the audience will, if it so please, permit me to use the words rewards and punishments in a sense dictated rather by convenience than technical accuracy.

I shall say little of sanitary rewards. If I shall succeed in sketching a view of sanitary punishments or penalties in such dark shades and deep shadows as will be necessary to delineate the background of the picture, then their contraries, or sanitary rewards, will take their places at their own suggestion or by implication in the foreground, and in such rosy tints as each auditor in his own fancy may envelop his idea of ruddy health, in the full flush of developing powers, progressing to the maximum strength and capacity of our race; even as the morning breaks out of darkness when

“Night’s candles are burnt out, and jocund day  
Stands tip toe on the misty mountain tops.”

When we consider derangement in the natural economy of the human body, we find it bears some analogy to derangement in the order of action that may obstruct the operation of a machine such as man may construct to perform certain evolutions or achieve certain ends. The matter may be treated of as entirely independent of qualities.

In the former, that of the human body, disturbance of function or organism, may be very much involved with questions of morals; but nature notices the obstruction or disturbance only, and corrects or removes the one or the other, or in default of that, destroys the subject of it without any exception, and without the slightest reference to the moral quality of the action out of which the obstruction or disturbance arises.

If a steam-engine with its fire-box and boilers is selected for illustration, it will be found that combustible material of a nature suitable to the purpose and according to the structure must be placed in the furnace in proper quantities and with a proper degree of continuity. If constructed for wood, coal will not produce what we will here call a healthy action, and would ultimately work destruction. If constructed for coal, wood in such quantities as it would take would not be sufficiently stimulating, and the result would be chronic debility with other irregularity.



If fuel of too rapidly combustible nature, as gunpowder or dynamite, were used, the result would be too stimulating, so to speak, and immediate disaster likely to ensue. If the liquids consumed in the boiler were not in accordance with the organism, the proper motive power would not be generated; if impure water were used the surfaces of internal organs would be corroded or the passages walled up with obstructive secretions; or if the fluid be of the best, and it be expanded into steam too rapidly or in excess, damage or destruction would ensue from that source.

If all these things were properly adjusted, then the neglect of piston-rods, cylinders and journals, or the use of unfit materials for lubrication, would result in difficulties analogous to rheumatisms and inflammations, with ultimate decrepitude and dissolution. If, to strain the figure a little, we could for illustration fancy the engine, for the time being, a sentient creature, able to select its own combustibles and other materials, manage its own steam-gauge, and it were to use coal when constructed for wood, or wood when constructed for coal, or were to fill its furnaces with indigestible, that is to say, with incombustible material, as stone or brick or earth, or if it were to use for steady diet tallow or tar or rosin, or were to swallow powder or dynamite, or permit its steam to rise above the limit of its strength, or were to use liquids that would obstruct or corrode its inner surfaces, then the same damage or destruction would ensue as in the case first supposed, nor would it make the slightest difference in the imposition of these penalties whether the engine exposed itself to them by accident or design, or through ignorance, or whether any or all these dangers were forced upon it by some agency to which it might have been subject, or which it could not resist.

The law of its organization would only take notice of the fact that its conditions were violated and the penalty would be inflicted. Nor would the law of its structure take the least notice of the reputable or disreputable character of what the engine might be doing at the time; whether it were forging guns to arm traitors, or dressing lumber to build a church, would in no way aggravate or palliate its non-observance of the law of its own being, nor render the punishment more or less certain or severe.

The human machinery—I trust you will for the sake of argument pardon the expression—is, apart from what is generally understood

as moral obligation, amendable to a law of its own, a law which, if violated, offers no opportunity for escape. The wrong done may be corrected, though not without loss, and so much of the penalty as shall not have been inflicted may be withheld. It is no avail to deny the fault, no advocate or attorney can be employed to bewilder the judgment that imposes the penalty, no jury can be selected, either on account of its wisdom or its ignorance, to agree or disagree concerning it, no witnesses can be bribed or intimidated to misstate the facts, no question of insanity, emotional or otherwise can be raised. No evidence of general good character will avail, no matter whether the conduct be voluntarily or involuntarily on the part of the offender, or whether he be engaged at the time in conduct as toward other laws creditable or infamous, if he violate the organic law of his own structure, the act is unlawful and unconstitutional as to himself and his posterity, and the punishment is absolutely assured.

In contending for obedience to the law of our organization physically, let me not be understood as holding it paramount to laws which include the regulation of conduct in relation to more enduring interests. The moral law is above the purely physical, but runs concurrently with it so far as the latter reaches, and then goes on with its sanctions into eternity.

There are some well-defined borders between the two codes, though in their antecedents and in their consequence they may largely involve each other. If the moral law commands, "thou shalt not kill," the mandate takes notice only of the person who kills, and is indifferent to the person killed. The physical law, on the contrary, is indifferent to the person killing, and only takes notice of the person killed. The moral law is interested in the moral turpitude of the act—the physical only takes knowledge of bones broken, or lacerated tissues that violate its own requisitions and executes final judgment in death.

When the moral law says "thou shalt not steal," it deals only with the thief, and does not regard the person stolen from. The physical law may or may not take notice of him who has suffered the loss, but if the robbery is such as to cause him to starve, then it does, and under its laws he suffers, perhaps dies. If in the first instance, that of killing, the violation of the natural law was by accident or in self-defense, through ignorance or insanity, it would not in the least miti-

gate the offense or for a moment stay the judgment. On the contrary, if the killing takes place under the latter circumstance, the moral law denominates it justifiable or excusable.

Within the last few days, and while preparing this address, I have read in the newspapers three different accounts of loss of life from small boats on Sunday. The first a party of irreligious boys on a pleasure excursion ; second, a party of devout young people crossing a little bay to their village church for worship ; third, two persons, perhaps physicians, on an errand of mercy or necessity to the sick.

There are large numbers of people who will comment only on the first of these occurrences, and it will be regarded as if by special direction of the Great Author of moral obligation ; or if the other cases are pondered and remarked upon they will be characterized as mysterious dispensations, involving apparent anomalies in God's providence, but only apparent on account of our limited knowledge of His ways.

However involved the conditions as they may appear to us, and numerous as may be supposed the shades or degrees of moral quality in the intents and actions of the different sufferers in the general loss and without proposing anything whatever from a moral or religious point of view, I may say this as applicable to all of them, that the natural law has to notice but the single circumstance common to the parties, and that is their inextricable submersion in an unnatural element, and consequent inevitable death.

The foregoing involves truisms almost too obvious for statement. The principle implied holds true throughout the following supposed cases, which, though supposed, are actually true as to facts, and exist more or less open to observation all around us.

In a pleasant and luxurious home, such as some of you know, a case like this may be found : There is a young daughter of the house, a girl to whom you are warmly attached. She is 15 or 16 years old—at that period of maidenhood where, according to Longfellow, the brook and the river meet ; affectionate and the exemplar of all virtues, she is beloved by her father, as was fair Ellen of the Lake by the Douglas when he shed tears upon a duteous daughter's head that would not have stained an angel's cheek. The mother, a woman of feeble constitution, and some weakness by inheritance, died a year or two after the daughter's birth. The young woman is

undersized for her age, has a little color in her cheeks, and her lips lack freshness and fullness. She is studious, too much so, and devoted to music beyond her strength. Her eyes are wonderfully expressive and a little convex. She wears glasses that blend so prettily with her features as almost to atone for their necessity. Her intelligence and general information are startling to older persons. She is not only perfect in her lessons, which extend to several languages, but is a great reader of fiction and current literature, while she also finds time for the standard and classic authors, ranging in stately costume on the shelves of her father's library. She was unlike other children, never cared for recreations, and has lived in-doors. Her father was never strong, and his affection for his daughter is intensified by her close resemblance to her mother. He will live quite a number of years, perhaps, to past middle age ; she will probably die at 20, or earlier, or if she lives much longer there will be an arrest also of intellectual power, and physical and mental failure will take place together.

The moral law will make its record of the case, and so will the sanitary or physical. The parties are unconscious of offense against either. Conscience, the prompter of reproach as to moral delinquency, has suggested no fault. As to the natural law, whatever violation has occurred, at least in the present and preceding generation, has not only been through ignorance, but as was believed by the parties through praiseworthy conduct.

Let us observe another case, common, but perhaps less common than the other. A girl a year or two older—her father has disappeared—he had the mark of syphilis inherited and acquired—her mother's constitution was also impaired. The girl was born, we will say, at the Wayne County Poor House, where twenty others similarly circumstanced were born the same year. There were no bonds of wedlock in the girl's family to hold it together. Her mother also died soon after the daughter's birth. She emerged from the almshouse at 5 or 6 years old and fell among thieves, grew up under bad influences, and without ever having heard of chastity became unchaste.

The diseases of her class had their taint in her blood when she was born, and they had been reinforced by her manner of life. She, too, was very much like *her* mother.

The young woman has lately died in hospital. Sweet sisters of charity, with crucifix pendant at their girdles, waited upon her with soft hands, and in gentle tones invoked for her pardon and comfort in the name of the blessed Mary, mother of Him who has compassion on such as she.

The moral law has made its record of this case also, and so has the physical ; how widely apart in the former, how many pages between ; and yet in the latter in their consequences how closely allied the two cases, inasmuch as they in violation of sanitary laws tended with the same certainty, and in about the same time, to the final penalty of death.

The sanitary law has held its scale with even balance over both processes, indifferent alike to the virtue in the one or the vice in the other. By widely separate approaches, both in their way unlawful and equally fatal, there has been during two or three generations in each family a pathway pointing to and followed steadily down to death.

In the first case, notwithstanding the alienation from normal conditions, and consequent deterioration that had taken place in the two generations immediately preceding, if the girl had not been taught to read until 6 years old, and then limited to proper intellectual application ; if without excess of reading she had been encouraged to such physical exercises as her constitution required ; if she had been taken from the piano stool for one-half of the time she occupied it, and placed on horseback, she would have had an appetite for food, been larger in size, developed in form, and might not have been near sighted. She would have lived longer, and if it had been her fortune to have married into a healthy line of descent, she would have born children through whom in the next generation, if their marriages were also healthy, nature would have perhaps restored the alienated forces, and a vigorous line have been re-established.

In default of any intelligent attempt in her behalf in the last opportunity afforded, the inherited and acquired debility became fatal, and the particular branch of life she represented was stricken off.

So in the other instance, notwithstanding a particular taint in the blood which nature resents with more tenacity than any other, if the girl had been virtuously reared and her physical system had oppor-

tunity to contend with its pre-existing deteriorations, with such advantages as thorough sanitary surroundings would have given her, she too, might have lived and married, and, if with a healthy person, born children, and nature would have had an opportunity to correct in that generation and the next the wrong done in the preceding. All favorable conditions being absent and replaced by those of a tendency to continue and aggravate the alienation from sanitary processes, the deterioration as in the other case is complete and the line perishes.

Nature in each instance has obliterated the deviating line, as she always does, when no conservative measures interpose to correct it. All morbid deviations from sanitary conditions have a tendency to further deterioration, and there is a point at which it must be final.

“What,” asks a profound medical writer who recognizes a physical failure as always antecedent to mental alienation, “are in reality the asylums for the iusane but the concentration of the principal degenerations of the human race.” The same writer adds, “Man, created to attain the end appointed by Divine Wisdom, cannot do so unless the conditions which insure the permanency and progress of the race be more powerful than those which tend to deteriorate and destroy it; and some cases of incurability against which the physician’s best efforts are shattered, are but the fatal termination of a series of anterior existences morbidly summed up and represented in one doomed individual.

As I have before intimated, the downward progress and final catastrophe are often delayed or averted by intermarriage of the weak with the strong during successive generations. This is, of course, not for the advantage of the strong, and nature does not recommend it in that direction. When it takes place, however, in the interest of the weaker, not as to sex but condition, nature accords the benefit or withholds it in proportion to preponderance of tendency.

Although the illustrations used apply to all conceivable cases transgressing sanitary laws, I will add another: Two young men, concerning whom all things are equal as to bodily condition, and as to predisposing elements by inheritance, start out together. The one, with praiseworthy desire to achieve great ends, devotes himself to more work in study or otherwise than his system, under the privations to which he subjects it, can endure. Taxing his energy in still

greater ratio as his strength fails, his appetite is lost, his color fades, until at last he is about ready to commence the duties he has destroyed himself to prepare for, his faculties of both mind and body give way, and he dies upon the threshold of the busy mart of commerce or temple of learning or of worship into which he had sought to enter.

The other, allured by all the temptations that beset youth, and resisting none of them, takes no heed to his way, exhausts his strength in the same length of time and is disgraced. The friends of each weep over their loss ; and while those of the former are consoled by the purity and loveliness of the character so prematurely overshadowed in death, yet it does not occur to either party how much, in a sanitary point of view, they owe their losses in common to alienations from essential conditions, which, though differing in kind, took the same direction and were equally fatal.

The process of nature in divesting the tree of life of deformed, enfeebled or fruitless branches, when such have passed beyond probable restoration, is conservative of the species, and were it not the rule, general deterioration of the race would be certain, and the limit of its duration rapidly approached. Indeed, it would long since have disappeared from the earth.

If two seriously impaired constitutions join in family relation, though they may live by mutual kind offices and good nursing to something like old age, yet their offspring will barely survive the age of child bearing, and if they again shall marry husbands or wives of a similar degree of deterioration the probabilities are against their having children ; but if they have them, they will be defective in one or more ways and develop the abnormal conditions inherited, often with variations and exaggerations, and die before maturity.

Nature will have cut off the descending line, or, to borrow an expressive phrase, have stamped out the product of digression from her laws. Every depreciating tendency of this kind arrested obviously raises the average tone of the public health and develops progress to higher ends.

This paper has only undertaken to deal with the most general principles, and these in merest outline. A subject for thick volumes cannot be even indexed in the brief time during which I may hope for your attention here.

Some good will have been accomplished if I shall be able to direct public notice to the general fact so well known, and by many so little considered, that nature has cut for sanitary laws a channel of their own, and no exemplary conduct under other regulations will afford the least safety to one who shall attempt to move counter to the current as it flows onward in obedience to the eternal fiat of Him who has for the good of His children fixed the conditions and directed the way.

A knowledge of this has its resulting obligations ; they are innumerable, and embrace the whole conduct of life, not to the exclusion of, but in harmony with moral obligations. They include man's duty to himself, the circumstances of his marriage, the care of his children, and they include the duties of municipalities, and states, and nations, out of which have grown such organizations as boards of health, and other precautionary and corrective associations. These have in view the questions of quarantine, contagion, sewerage, ventilation, infection, which neglected, may some of them form alliances, and project a plague to which the innocent and the guilty may be alike exposed.

There are great calamities which, with our present knowledge, we may not be able to contend. Often the pestilence so walketh in darkness that its footsteps cannot be traced, except by the cries of its victims. Hurricanes also, devastate districts, sweeping down habitations and enraging the seas, scatter indiscriminate death by land and water, irrespective of merit or condition. Earthquakes not only "topple down steeples," but sometimes

"Smack" their mumbling lips  
O'er a thick peopled city."

Men are not wholly selfish either as to themselves or the generations in which they live. The patriot soldier forfeits his life to perpetuate that of his nation ; in the very article of death his vivas ring out with "long live the republic" ; the statesman labors to provide constitution and laws that will give endurance to his country ; the Christian father, as he attaches value to his creed, seeks to transmit it free from error or defect to his sons and daughters—physicians are always on the alert for sanitary discoveries that may improve the present age and reach forward to coming generations.

The indications are that our race is still progressing physically in the direction of its maximum possibilities, the average duratio



life is a little extended ; plagues appear at longer intervals and are less severe ; contagions have been made amenable to human control. The movement is very slow, because the gods grind so slowly, and so exceeding small. But comparing centuries with centuries we obtain observations that demonstrate the progress and make it seem worth while to live ; while the immense advance in mental and mechanical attainment of itself implies a healthy direction in sanitary condition.

It must continue to be the duty of the boards of health to keep up the onward movement, so that in the voyage of life the fleet, freighted with all our great worldly interests, shall not lose steerage way, because if permitted to go astern or drift otherwise the time will come when the soldier with feeble knees will lean on his musket for support in an uncultivated and barren land, statesmen and politicians, imbecile or insane, will dissolve into dust in conventions, like the horse shay on the road, attenuated preachers will stretch out thin hands over congregations of lost bodies, dyspeptic and morose ; and physicians, themselves cadaverous, will have for patients the public in a decline.

A military engineer, estimating the course of a projectile, has first to calculate what would be its force and progress if moving in vacuum ; he then considers the atmospheric conditions through which it must pass, and the degree of the earth's attraction that must ultimately bring it down.

The physician in calculating the progress of the public health has first to consider what would be life's average duration were all things favorable to longevity. He has not all the advantages of the engineer, because the obstacles are more complex and variable in action, the atmospheric effects are not so nearly equal, and the earth's influence not so uniform as gravitation, though equally certain to bring the body down at last. He can only approximate the positive truth and apply his learning to a comparison of probabilities with facts, learned and treasured up by his contemporaries and those who have gone before him, a series of observations out of which science is slowly evolved.

The writer of this paper having no professional learning and little science, with no exact and complete knowledge of anything, may perhaps represent the average condition of the people who look to such learned doctors as have called this Convention, that they may so direct us, not only as to our public safety, but as individuals, that we may hope to escape the necessity of their more particular and professional personal services.

## COFFEE TAVERNS AND TEMPERANCE SALOONS.

The effort to prevent the sale of intoxicants by passing prohibitory enactments has been almost given up in this country. We hear much less about it than ten or twenty years ago. Where it has been tried, it has usually proved unsuccessful; the endeavor to make it a political "issue," on any large scale, has completely failed; and the opinion is gaining ground that it is better to convince the public that the use of the stronger alcoholics as beverages is, on the whole, hurtful, than to attempt to force on them, by law, such an opinion, when they don't believe it.

Meantime, other and more rational endeavors are being carried out to remove the temptation to drink alcohol. It is being recognized that men crave and will have some stimulant, some analeptic, some nervine tonic, or narcotic, and that if they can as easily and pleasantly imbibe one which is of moderate power, they will not run after those more potent and more virulent.

In countries where the Mohammedan and Buddhist religions prevail, both of which forbid, as one of their most stringent injunctions to the pious, the use of fermented liquors or intoxicating *drinks* of any kind, they whip the devil around the bush by smoking opium and chewing hasheesh. The Siberian savage stupefies himself with a poisonous fungus, or by swallowing tobacco; and the cocoa and maguey were prized for the same purpose by the red Indian before Columbus saw the shores of the New World.

Hence, it is rational to supply this universal craving, and it is wise to supply it with some substance which will have the minimum of ill effects. For this purpose there has been, of late years, both in this country and England, a great increase in coffee houses, cocoa taverns and holly tree inns; and their success has been decisive. At the opening of one in England, the other day, the Right Hon. J. H. Walpole remarked that many excellent persons in that country were of opinion that the vice of drunkenness might be effectually dealt with by governmental coercion and prohibitory restrictions; but in his own mind he was confident that no attempt on the part of a government to remedy the evil could ever succeed. What Government could do in the matter it had already done, and any further legislation would only have the effect of setting the people

in opposition to the law. They wanted some place of meeting where they could enjoy social intercourse without the temptation to indulge in excessive drinking, and this necessity these coffee taverns amply provided. In this last-mentioned respect we do not think the coffee houses in this country are equal to those in England. If there is one in Philadelphia where one can enter, have a seat, a table, the evening paper and a cup of coffee, all for five cents, as he can in any of a thousand beer saloons, we don't know it.

Enough attention has not been given to introducing, and preparing in agreeable form, the various stimulating and soothing vegetable infusions which may take the place of the cup which inebriates. Coffee and tea are by no means the only ones which are to be found. Cocoa and chocolate, as prepared in the United States, are usually flat and nasty; but as in Mexico and Central America, strengthening and delicious. Paraguay tea, or maté, is said to be agreeable to the taste, and must be largely consumed, as the annual crop on the government lands in Paraguay is officially reported to be worth \$200,000. It is a species of *Ilex*, and another species, *Ilex cassine*, grows in our Southern States, and has been used as a domestic beverage. Both contain between one and two per cent. of caffeine.

As a mild stimulant, the cocoa (*Erythroxylon coca*) of Peru ought to be largely cultivated. The German traveller, Dr. Von Tschudi, found an infusion of it most invigorating after great toil. Very little of it finds its way to foreign nations. According to the official statement of the government of Peru only fifteen hundred weight (15 quintales) were exported in 1878. Were the demand greater, no doubt more would be cultivated.

Pure coffee should be on sale at such taverns; but the public should be induced, by their lower price, to prefer some of its modified forms, "coffee-surrogates," as they are called. In Europe, chicory is one of the most important of these; and, as it is imported into the United States at the rate of nearly *four million pounds* a year, our people must drink considerable more of it than they are aware of. It makes, mixed with coffee, a healthful and excellent beverage, and, to our own palate, more agreeable than the pure coffee.

The *Chemiker Zeitung* mentions a process recently patented in Germany for a similar substance. Wheat is boiled by steam heat, and well washed, to remove all impurities. A proportion of 3 per

cent. of bicarbonate of soda is then added, the mixture is dried, roasted and ground, and is then ready for sale.

Many of the vegetable bitters could be made into palatable and refreshing beverages, acting sufficiently as nervines to remove the sense of fatigue.

Where such drinks could be had, together with newspapers, seats, games and other amenities, people would very willingly pass their hours of relaxation, and not want intoxicants.—*Medical and Surgical Report.*

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#### NEGLECT OF NATURES LAWS AND THE PENALTIES.

What if, for want of obeying the laws of nature, parents bred up neither a genius nor an athlete, but only an incapable, unhappy personage, with a huge upright forehead, like that of a Byzantine Greek, filled with some sort of pap instead of brains, and tempted alternately to fanaticism and strong drink? We must, in the great majority of cases, have the *Corpus sanum*, if we want the *mentem sanam*; and healthy bodies are the only trustworthy organs for healthy minds. Which is cause and which is effect, I shall not stay to debate here. But wherever we find a population generally weakly, stunted, scrofulous, we find in them a corresponding type of brain, which cannot be trusted to do good work, which is capable more or less of madness, whether solitary or epidemic. It may be very quick at catching at new and grand ideas—all the more quick, perhaps, on account of its own secret malaise and self-discontent: but it will be irritable, spasmodic, hysterical. It will be apt to mistake capacity of talk for capacity of action, excitement for earnestness, virulence for force, and, too often, cruelty for justice. It will lose manful independence, individuality, originality; and when men act they will act from the consciousness of personal weakness, like sheep over a hedge, leaning against each other, exhorting each other to be brave, and swaying about in mobs and masses. These were the intellectual weaknesses which, as I read history, followed on physical degradation in imperial Rome, in Alexandria, in Bazantium. Have we not seen them reappear, under fearful forms, in Paris but the other day? I do not blame; I do not judge. My theory, which I hold and shall hold to be fairly founded on a wide induction, forbids me to blame and to judge; because it tells me

that these defects are mainly physical, that those who exhibit them are mainly physical ; that those who exhibit them are mainly to be pitied, as victims of the sins or ignorance of their forefathers. But it tells me, too, that those who, professing to be educated men, and therefore bound to know better, treat these physical phenomena as spiritual, healthy, and praiseworthy ; who exasperate them, that they may make capital out of the weaknesses of fallen men, are the most contemptible and yet the most dangerous of public enemies, let them cloak their quackery under whatsoever patriotic or scientific or even sacred words.—*Cannon Kingsley, in Good Words.*

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#### THE FORCE OF PURPOSE.

There is no physiological reason to suppose that mental purpose augments the force available for physical activity, but it certainly calls a larger amount of the reserve stock of potential energy into operation, while it concentrates the powers of the system on the particular end in view. How else are we to account for the familiar fact that under the pressure of circumstances, or at the bidding of motives that incite to feats of unwonted exertion and endurance, persons of no ordinary physique are enabled to perform seemingly impossible achievements? Sometimes the energy of an enterprise may, as it were, overpower the agency by which it should be effected, and the result is a break-down in the crisis of accomplishment. As a rule however, happily, determination will carry a man through undertakings which seem so vast as to threaten to overwhelm him. Possibly at no time are the "possibilities" of personal work of a nature which combines activity of both mind and body more conspicuously illustrated than during a "general election." And few events of the class have called out more latent vigor than the time through which we are now passing. From the stupendous exertions of Mr. Gladstone in Scotland to the sleepless energy of some of the candidates and their agents in large constituencies like those of the metropolis, the process of "calling up the reserves" of psycho-physical force is proceeding at a pace and to an extent rarely equalled. Presently the crisis will be passed, and then the exhaustion will begin to declare itself. Those will be wise who recognize what it is they are doing. The stock of force on which they are drawing is not increased to meet the occasion. They are simply using up in an

emergency what nature has designed to be held in reserve, like the residual air in the lungs, or the volume of atmosphere in the wind-cushion of a set of bag-pipes. If this reserve be exhausted there will be no resilience, and nothing left to play upon. The illustration is inadequate, but it will suffice to point out our meaning. The fact that a great effort can be made must not be assumed to show that such an outcome of force is natural. While the feat is in progress, a serious break-down may occur at any moment, and the power of recuperation will in that case be found to be itself exhausted. When the special exertion is over, the fatigue that follows will be more than common weariness. It will be a "dead-point" in the progress of vitality at which special measures of help and recovery are sure to be necessary.—*Lancet*.

#### A FUNGOID GROWTH—THE CAUSE OF WHOOPING COUGH.

BY HENRY A. MOTT, JR., PH.D. E.M., in *Scientific American*.

In 1871 Dr. Ludwig Letzerich commenced a series of microscopical investigations as to the real cause of whooping cough, and his original investigations are to be found in full in Virchow's *Archiv*, vol. 49, p. 530.

Letzerich showed, for the first time, that if the expectorated mucus whooped up during the short duration of the first catarrhal-like stage of the disease, be examined under the microscope, there will be seen, besides the portion of phlegm, etc., etc., small elliptically brownish-red fungus spores, some of which have partially germinated and brought into existence mycelium. The discovery gave a clew at once to the cause of pertussis, and opened a new channel for its treatment.

As the editor of the *Quarterly Journal of Microscopy* stated that this observation of Letzerich had not as yet been confirmed by any other investigator, and having an opportunity offered to study the disease in my own children, I concluded to do so, and after a careful microscopical investigation of the phlegm whooped up at various stages in the development of the disease, I can now state that in the main my investigations confirm those of Letzerich.

The ripe spores of whooping cough differ from those of diphtheria in not being circular, and in not showing any finger-like protuberances. The growth of the mycelium in the masses of phlegm goes

on very rapidly, and the threads acquire considerable length, especially when the disease is at its height. The expectorated mucus is also very thick at this stage, and on drying becomes of a glossy appearance, although quite tenacious. In these latter stages the mycelium are very plentiful, and there is an energetic formation of spores. If the fresh spores are treated with iodine and concentrated sulphuric acid, the mycelium are coloured beautifully blue, and the unripe spores, which are white, now appear brown. To show how this theory was received by Dr. Hamilton, who made such a careful investigation of all theories, I will quote what he says: "The only theory that seems to me tenable, and I think the success of certain remedies bear it out, is that whooping cough is the direct result of a fungous growth; that the spores are thrown off by the individual coughing, and are received by another in the saliva of the mouth, which retains them until they have time to attach themselves to the underside of the tongue, where the mucous membrane is the thinnest and softest of any part of the mouth, and at the same time are not so liable to be dislodged by drink or food. In this situation they remain until they are able to germinate and spread along the sides of the tongue and backward until they reach the larynx and pharynx, when the full whoop is established. Elevations or lumps can very plainly be seen under the tongue before the patient begins the whooping, but the catarrhal symptoms at this time are quite prominent; discharges from the nose, suffused eyes, headache, some fever, and general lassitude. The time of incubation is from nine to fifteen days, though varying in the different subjects. These elevations on either side of the frænum linguæ are small, and might escape observation unless carefully sought for, as it is quite difficult to induce the young subject to turn the point of the tongue up long enough to make proper observations."

Letzerich made numerous experiments on rabbits with the spores from whooping cough. The spores were cultivated on pieces of bread soaked in milk, and then introduced into the trachea of young rabbits for future development. This was affected by tracheotomy, but the animals rapidly recovered from the effects of the operation, and in a short time became affected with a cough—the same as whooping cough. The rabbits were killed, and their air passages and lungs were found to contain enormous quantities of fungus; the expectorated mucus was also the same as in man.

From Letzerich's valuable investigations he was able to show the difference between the action of fungus in diphtheria and that in whooping cough. He says: "Disease produced by the vegetation of fungi in the epithelium stratum of the respiratory organs are of two kinds. 1. *Diphtheria*: The vegetation of the fungus originates at the head of the windpipe and trachea, seizes and destroys the epithelium with startling rapidity. 2. *Whooping Cough*: The fungus germinates in the epithelium web; at first in the upper part, and then over the whole respiratory organs, without destroying the web, produces whooping cough and its manifest complications. If the growth of the fungus is confined to the epithelium of the epiglottis, of the larynx, and trachea, then it is simply whooping cough; but if the fungus enters into the delicate bronchial tubes and the cavities of the lungs, then the dreaded complications arise."

It is therefore best to meet the disease in its earliest stages, with the object to kill the fungus and prevent its further development; and then we shall seldom have the complications of bronchitis, cholera infantum, or cerebral difficulties to contend with.

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#### THE EUCALYPTUS AND THE PINE, CONSIDERED RELATION TO THEIR SANITARY PROPERTIES.

BY C. T. KIOGZETT, F. C. S., F. I. C.

*The following is an abstract of a paper read before the Health Section of the Social Science Congress at Manchester, October, 1879. From Sanitary Record.*

It is widely known, that the Eucalyptus and the Pine have long enjoyed a popular reputation as health agents. In particular, the Eucalyptus has acquired the character of an antimalarial tree; and, under the title of the 'Fever-destroying tree,' has been largely cultivated in various parts of the world, with the view of rendering habitable large districts previously devastated and depopulated by malaria, etc. In reference to the old theory of the action of the Eucalyptus, which attributes its sanitary properties to its drainage powers, this hypothesis always lacked evidence, and at its best was of a negative character. In the first place, the Eucalyptus is only superior to other trees as a means of drainage in the proportion in which its rate of growth exceeds that of other trees; and this is not sufficiently notable to account for its marvellous fever-destroying properties. Again, other trees, even if planted in malarial districts, do not free them from the disease, so that the action of the Eucalyp-



tus is of a positive type, and, like the Pine tree, its properties are of a healthful nature, upon whatever soil or in whatever climate it may grow, whether in deep valleys or upon the sides of mountains. Others have maintained that just as Pine forests were supposed to exert their beneficial influence upon persons suffering from pulmonary and other affections, by virtue of the volatile emanations proceeding from them, so the Eucalyptus produced its well-known effects by the oil which is evaporated from its leaves. The genus Eucalyptus embraces over 130 species, and of these, Eucalyptus Amygdalina is the most abundant oil-giving tree, one hundred pounds of the leaves giving from three to six pounds of the oil. This oil is practically identical in composition with the oil of turpentine derived from Pine trees, and with most of the so-called essential oils or perfumes. During an investigation extending over many years, I have ascertained that all these oils, when subjected to the action of atmospheric oxygen and moisture, produced peroxide of hydrogen (a substance resembling ozone in its oxidising properties), and a number of camphoraceous substances having marked antiseptic powers. Knowing, then, how much of these substances are yielded in the laboratory by a given quantity of oil of eucalyptus or oil of turpentine, I have extended my calculations to the Pine and Eucalyptus forests which are so abundantly distributed in Nature. Taking New South Wales and South Australia alone, I calculate that the Eucalyptus forests of this district contain at any given moment sufficient oil in the leaves (ready to be evaporated into the atmosphere under the agency of warm winds) to form by contact with the atmosphere no less than 92,785,023 tons of pure peroxide of hydrogen and 507,587,945 tons of camphoraceous principles. Now, if it be remembered that in Nature all matters of animal and vegetable origin are oxidised by the atmosphere, which is thus kept free from the pernicious products of putrefaction, and that peroxide of hydrogen is a much more powerful oxidant than ordinary oxygen, and if it be also borne in mind that the camphoraceous products above referred to are also powerfully antiseptic, then the health powers of the Eucalyptus can neither be wondered at nor be longer open to any doubt. What is true of the Eucalyptus is true also of the Pine, and on an immensely larger scale; for Pine forests are freely distributed over both hemispheres, and the oil of turpentine, which is a natural product of these trees, undergoes the same chemical changes in the atmosphere as oil of

eucalyptus. By imitating this natural process of oil oxidation, I have succeeded in obtaining and rendering available in commerce the antiseptic and oxidising principles to which Pine and Eucalyptus forests owe their hygienic influences. The manufacture is being largely conducted. I have named it 'Sanitas', for want of a more expressive title.

"WORRY" A CAUSE OF DISEASE—It is true, as stated by Spencer that every pleasure or enjoyment gives a better physical life, and lengthens our days; and it is equally true that every worry, or unpleasantness, diminishes our present stock of life, and shortens our days. Of course, when we speak of pleasure or enjoyment, we refer to that rational pleasure which follows the legitimate use of the various functions of the body. We are not to understand that that which some regard as pleasure—say, a crowd of roughs, whisky, and late hours, or excesses in any direction—though thought pleasurable, are to be regarded in this light.

I think the explicit teaching of these facts will be a great benefit to any community. "A merry heart maketh a cheerful countenance." "He that is of a merry heart hath a continual feast." "But by sorrow of the heart the spirit is broken." "A good report maketh the bones fat." All this is good to think of, for we have a distaste for self-mortification, and we rather like the comforts and enjoyments of this world; and if this is best for us, physically, mentally and morally, we should know it.

I find people all the time who make themselves miserable, make themselves sick, and kills themselves by "worry." They always look at the dark side, season their food with bitter herbs, see labor as the Adamic curse, beget their children in sorrow, and even deny themselves the consolation of religion by worshiping a God who has the attributes of the devil. You have seen these people, and know some of them intimately, and have doubtless been troubled with such "worry." It is worry, not work, that wears people to the bone, and finally kill them.

I am accustomed to look at this matter as an element of many diseases, and, in so far as I can, help the person to a better condition of mind. Worry means a variable appetite, poor digestion, blood-making, and nutrition, and especially a want of rest and sleep, which are both essential to health. Relief from worry means an improvement of every function of life, and many times recovery from disease. —*Eclectic Med. Journal.*

WE HAVE TO RECORD THE DEATH of the Rev. Henry Moule, M.A., vicar of Fordington, in Dorset, whose name was closely identified with the cause of sanitary reform, he having been the author of several pamphlets on drainage and water-supply. He was, however,

perhaps better known, and will be best remembered, as the inventor of the dry-earth closets which bore his name. He had reached the advanced age of seventy-nine, and was a staunch and consistent teetotaler in practice. His funeral was attended by Dr. Blaxall, representing the Medical Department of the Local Government Board.

FURTHER ELABORATING the Rev. Henry Moule's idea, Mr. Geo. Barnard proposes to solve the difficulties of the sewage question by the introduction of a system which he calls the Earth Column. The plan is to separate the liquid from the solid sewage by a series of filtrations through earth, which would have the effect of passing off the former to the sewers in a nearly purified state, and of retaining the latter in a fit state to be employed for agricultural purposes. The idea is certainly ingenious, but its practicability requires to be tested before any definite opinion can be offered as to the wisdom of adopting it.—*Med. Times and Gaz.*

WHY WE CRY.—It is popularly regarded as a sign of weakness to cry, and *per contra*, as a sign of bravery and fortitude to bear pain without a murmur. There is something grand in the sight of poignant suffering borne without complaint, but the exhibition is given at the expense of the sufferers. There is no doubt that the moan is a vent to pent up agony, and that it relieves very materially severe pain. It has been maintained, with what truth we, however, do not know, that those patients recover more rapidly after injuries or operations, who give way in the natural manner to their natural feelings. An instance is recorded in which a man by giving vent to his emotions reduced the pulse which under the tension had reached 126, to 60 in a few hours. If the theory is a correct one its practical bearing is important. In the case of children it is not proper to endeavor to restrain by motives of fear, the crying which expresses pain. We have known children to be whipped inordinately for some offence, and then whipped to compel a suppression of the cry which is nature's method of expressing the fact that the end for which the castigation is administered, intense smarting, is achieved. Such treatment of children is not only brutal, but in contravention of all physiological law. If the child must be whipped, which is often a necessity, let it give vent to the feelings which if pent up may work mischief irreparable. Its nervous organization is a delicate one, it cannot be trifled with with impunity.—*Michigan Med. News.*

THE TRANSMISSION OF SCARLET FEVER BY MILK.—A report has been issued by the Local Government Board on a sudden outbreak of scarlet fever at Fallowfield, near Manchester, England. The outbreak included 35 persons, belonging to 18 families, and of the individuals who suffered not less than 24 were attacked within 36 hours, between Sunday morning and Monday evening. Dr. Airy was directed by the Local Government Board to investigate this

outbreak, and the results of his investigations are, says the *Lancet*, given in the report now before us. The outbreak was quite local, and the different details elicited tended to the general result that the infection had been distributed to the families through the agency of a particular milk supply. The facts bearing on this point do not well admit of any other interpretation. The question of the mode in which the milk could have become infected was not so fully cleared up, but it is shown that one of the milkers on the dairy farm lodged in a farm-house where scarlet fever was present at the time when the milk presumably became infected, and it is suggested that the infection was communicated to the milk, in some way undetermined but not inconceivable, through his agency. The report throughout is of very considerable interest, and forms an important contribution to our knowledge of the *mechanism*, if we may so write, of certain of the observed phenomena marking the progress of infectious diseases.—*Scientific American*.

TOBACCO—EFFECTS OF ITS USE UPON CHILDREN.—M. Decaisne states that of thirty young people observed, twenty-seven present noticeable effects of tobacco upon the body. Even its restricted use by children often leads to a change in the blood, and sometimes to chlorotic anæmia, paleness of the face, emaciation, morbid sounds in the carotid arteries: palpitation and intermittence of the heart, diminution of the normal quantity of the blood corpuscles, difficulty of digestion, etc. The ordinary treatment of anæmia and of chlorotic anæmia produced no effect in general while the habit continued. Young people who smoke show generally a certain sluggishness of intelligence and a more or less pronounced taste for strong drinks. In children who cease to smoke, and who are not affected by any organic lesion, the disorders for the economy which have just been mentioned disappear, often very quickly, and almost always without leaving any trace. The effects of tobacco smoking in women very closely resembled those observed in children.—*Brit. Med. Jour.*

A CASE OF MERCURIAL POISONING.—The *Indiana Medical Reporter* records the particulars of a suit for malpractice against a physician of that State who is claimed, by the improper use of calomel, to have caused a fortunately rare condition in a child twelve years of age. The patient was treated for congestion of the brain, and in addition to the cold water douche was placed on calomel, the quantity of which not appearing in the testimony, further than "seven or eight powders" were given, one every two hours. In about five or six days the mouth became sore, the gums, cheeks and palate being also implicated. The flow of saliva was excessive, the teeth loosened and many dropped out. There was also absorption of the alveolar process, the gums resembling those of

old persons prepared for an artificial set of teeth. In addition to this there remained almost complete immobility of the jaw, due probably to muscular contraction, there being no evidence of ankylosis on either side.

The defence held that the untoward results were not due to the calomel, but were idiopathic—*cancrum oris*; but the jury would not view it thus, and gave a verdict for \$800.

DOMESTICATION AND BRAIN GROWTH.—At the recent meeting of the British Association, Dr. Crichton Browne gave an address on the influence of domestication on brain growth. He had found by experiments that domestication had greatly reduced the brains of the duck, and he argued that men, like ducks, might be fed and housed, fenced about, and exempted from participation in the life struggle, until, like the ducks, they would depreciate in mental capacity. Their bodies might increase in size and succulence, but their brains would become straitened and withered. Disease and luxury crippled the brains. It was as true as ever that men were perfected through suffering, toil and conflict, and it was not through affluence and comfort that genuine civilization was attained. It was the civilization, not merely the domestication of mankind that must be aimed at.—*The Dental Advertiser*.

A PROMINENT PHYSICIAN had his house inspected by a plumber, who found the main drain in the cellar running below a concreted floor. Just within the cellar wall there was a perforated cap on the drain, ingeniously contrived to let the sewer gas into the cellar. A branch drain ran to the furnace, and was intended to carry off any water which might collect in the depression where the furnace stood, which was not concreted. The draught of the furnace of course continually sucked the sewer gas through the perforated cap and through this drain, but the intelligent (?) owner could not be convinced that this was not an exceedingly simple and effective arrangement.—*Sanitary Engineer*

QUEER MALARIA.—The *Sanitary Engineer* says that in Brooklyn, N. Y., a plumber was asked to inspect a house in which were three cases of malarial fever. In the cellar he found that the cold air box ended at the area without any opening to the outer air. It was built of unseasoned wood, which had warped so that large cracks admitted the damp ground air to feed the furnace. Within the box he found the remains of a cat and two rats. The furnace had been lighted just four weeks previously, and the first case of illness had occurred one week later and the other two soon afterwards.—*Detroit Lancet*

A BILL for the establishment of a State Board of Health for New York (*Sanitarian*) has been introduced into the legislature, which

provides for a board of nine persons: The State Engineer, the Attorney-General and the Health Officer of the port of New York are to be *ex-officio* members. The Secretary of the Board alone is to be paid. The members receive actual travelling and other expenses. The Secretary must be a person skilled in sanitary service and a member of the Board or otherwise. The sum of \$15,000 is appropriated for the Board the first year. The Secretary of the Board is to be the Registrar of Vital Statistics for the State.

**MORTALITY FROM DIPHTHERIA.**—During the four years from 1873 to 1876, inclusive, 7,877 persons died of diphtheria in New York city. In Massachusetts it is second in fatality to consumption. An equally large death-rate has existed in many other cities and states. The disease is almost as bad in England. Dr. Fergus in his address before the British Medical Association at its last meeting mentioned diphtheria as a disease which sanitary science had hardly as yet begun to control.—*N. Y. Med. Rec.*

THERE is no telling what the ignorance, boldness and complete self-possession of an impostor will do towards inspiring confidence among unthinking people; and there is no accounting for the mania with which people thirst after humbugs and deceptions. The truth is far too tame and uninteresting for many people—in order to be fascinated they must be fed on fiction.—*Canada Lancet.*

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## Annotations.

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### GARDENING—THE CULTIVATION OF FLOWERS.

Gardening whether for pleasure or for profit is perhaps the most beautiful occupation that can be engaged in, and should be universally encouraged. Below we give a communication, from an exchange, on ornamental flower planting which we trust will prove profitable in this way as well as interesting:—The method of planting ornamental foliaged and blooming plants in curved or straight lines, so as to produce pleasing effects by contrast and harmony of color, which has been for some years in practice in the gardens of the Old Country, and more recently the United States, appears to have received but little attention by the garden-loving public of Montreal, and yet nothing can exceed the beauty of these ribbon borders during the later summer and fall months. It would occupy too much of your valuable space to attempt to describe fully the glorious effects thus produced in the gardens of the Crystal Palace,

Sydenham, Frogmore, the Duke of Sutherland's at Trentham, Staffordshire, and many others in England; and although on a smaller scale of magnificence, some in the United States, notably those of H. H. Hunnewell, Esq., and W. Baker, Esq., of Boston; but to give your readers an idea of what may be achieved in this style of planting I send you herewith a sketch of a floral butterfly, with a reference key to show what kind of plants should be used. The size of the butterfly is 17 feet 6 inches across the wings, and 22 feet from the points of the antennæ to the lower tips of the wings. To make a complete success it will be necessary to plant pretty thick, say about four inches apart, and to keep the plants dwarf and bushy, the points of the shoots must be carefully pinched off as they grow. The bed should not be planted before the soil is well warmed up by the sun, certainly not before the first of June, and if the soil is good garden ground they will then grow rapidly without any check; and, keeping clear from weeds until after they cover the ground, they will take care of themselves for the remainder of the season.

1. New crimson altanathera. 2. Golden feverfew. 3. Blue Ageratum dwarf. 4. Altanathera pyronichoides. 5. Stevia compacta, variegated. 6. Crimson achyranthes. 7. Sedum variegatum. 8. Altanathera amœna. 9. Grass. 10. Steva. 11. Golden feverfew.

It would be folly to suppose that such a bed could be made without trouble or expense, but those plants can all be purchased in quantities at a reasonable price, and it would not be unreasonable to suppose that ladies and gentlemen who do not think much of spending a large sum for an evening party or a picture would refuse to invest a much smaller amount for a garden decoration which would give pleasure to all who see it, and would show what nature assisted by art is capable of. Persons of humbler means or less pretensions may have beautiful effects produced by planting round or oval beds in different shades of colors, or in the shape of stars, crescents or scrolls. For this purpose the dwarf horseshoe geraniums, coleus, achyranthes, altanathera, stevia, golden feverfew, lobelia, sedum variegated, etc., are the most useful. Verbenas should be planted in beds by themselves, as their trailing habits is hard to keep under; for if they grow well they will run where they are not wanted and spoil the definite effect necessary to the ribbon style.

## THE MIND IN ECLIPSE.

At a meeting in March last of the Medico-Legal Society, of New York, Dr. George M. Beard read a paper on 'The Problems of Insanity,' in which he said: "It is a paradox of astronomy that the sun may best be studied during an eclipse; and in psychology the mind may be studied best when it is eclipsed."

'Insanity is a disease of degrees; there is no plain dividing line between sanity and insanity. Insanity may be divided into two kinds—intellectual insanity, embracing forms in which there are delusions, and emotional insanity, in which there are no delusions. Insanity is a barometer of civilization, and as we advance higher in the arts and sciences so will insanity become more prevalent among us. Intense application, brain work, and indoor life are the agencies which most frequently bring it about. With savages or barbarians there is little or none of it. The intellectual activity of the women of to-day is another great cause of insanity. What the mother is, so will the child be in an intenser degree.

'Insanity is increasing most perceptibly in Europe and America among the poorer classes. Civilization grinds hardest on the poor, shutting them up in close houses, with bad air and poor food, and compelling them to struggle for existence. The brain cannot always bear up under the strain, for they have few recreations and amusements which can be indulged in for the relaxation of their minds. A diagnosis in cases of insanity is most difficult. The physician must know the subject psychologically; know he thinks, what he thinks, and all about his general dispositions, passions, etc. The probabilities of cure in the case of insane persons depend greatly upon the advancement of the disease when the treatment is begun. It is better if the patient can be treated out of the asylum, and if he is not confined or isolated altogether from the world, narcotics and stupefying remedies should not be used when their use can be avoided. Until a comparatively short time our inventions have tended to an increase rather than to a decrease of insanity. Of late, however, the inventions, have been in the opposite direction, tending to give us more ease and rest, as, for example, the telephone, elevated railroad, and the electric light. If the latter is perfected, it may also enable us to breathe purer air. An improved system of education, with less "cramming," would tend to reduce the increase of insanity. The eclipse of the mind cannot be predicted like the eclipse of the sun, but, with study, men may learn to detect it in its first stages, and, if treated early, it need rarely become serious.



## ON THE IMMEDIATE AND PERMANENT TREATMENT OF DISEASE.

Some months ago, in this JOURNAL, in an article on the Macrobiotic Art, we drew attention to the fact that, in the treatment of diseases, both patient and physician, intent upon immediate relief and cure, are apt to forget that the means employed may sometimes do harm, or shorten life. Dr. J. Milner Fothergill (*Detroit Lancet*, from *London Lancet*,) points out numerous cases in which it is plain that the treatment which gives immediate relief is not that to be continued in the permanent interests of the patient. Thus the free use of opium in the hacking cough of phthisis and in chronic bronchitis gives immediate relief, but eventually does harm. In the diarrhoea due to impacted masses in the rectum, astringent mixtures might give relief, but they were not curative, while the removal of the masses was. So, too, in neuralgia, the injection of morphia eased the pain for the time, but if continued was more likely to confirm than to ease it. In dyspepsia, of reflex origin, the ordinary mixture relieved it, but its cure depended on the cure of the exciting cause. In gout the application of leeches or cold gives instant relief, but the evil consequences of such treatment are obvious. In endocarditis the rule is to give tonics as soon as possible, and get the patient up, but he contends that the proper treatment is to keep the patient flat in bed for some days after all evidence has passed away. The growth of connective tissue in the valve curtains, which is lighted up by the inflammatory storm that passes over the endocardium, persists for some time after the endocarditis itself is over, and it is the mutilation caused by the contraction of the neoplasm which we have chiefly to dread. Hence the true line of practice is to reduce the strain upon the inflamed valve curtains, by complete rest and the administration of agents, which lower the blood pressure within the arteries and heart. The more the connective tissue growth can be limited at the outset, the less the future mutilation of the valves. A few days in bed are nothing compared to future valvular disease.

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DR. THOS. G. MORTON has measured the length of the lower limbs of over two hundred boys at Girard College, Philadelphia, Pa. He found asymmetry and not symmetry the rule, the difference in length ranging from a fraction of an inch to an inch.

## FIRE-PROOFING COTTON FABRICS

In a paper on some conditions of inflammability, (*Scientific American*), read before a sanitary convention in Michigan, Dr. Kedzie, of the State Board of Health, said that cotton clothing could be prevented from taking fire by the use of borax in starching—a teaspoonful to each pint of starch after the water has been added. The borax can have no injurious effect upon the cloth or upon the wearer, and is so cheap that all can afford to use it.

Dr. Kedzie showed by experiments that muslins and tarletans, the most inflammable goods, when treated with borax starch, could not be made to burn with a blaze. If all cotton dresses and underclothing, and especially the clothing of children, were treated in this way, a great number of lives and much suffering would be saved every year.

Dr. Kedzie said he expected that one of these days some shrewd fellow would use this receipt, mix starch and borax, and sell it as "asbestos starch," or with some other catching name, at 500 or 600 per cent profit, and get rich out of it. The people could just as well do their own mixing and save the profit.

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PURE RAIN WATER.

Since it has been so abundantly proved that disease often results from the consumption of water from wells, which has percolated through soils containing various impurities, the use of filtered rain-water is becoming yearly more common. But the water as it passes from roofs to cisterns, is often needlessly foul, and filters are choked sooner than necessary with impurities. We observe in a quotation by the *Garden* from Shirley Hibberd's new pamphlet entitled "Water for Nothing," the description of a simple automatic contrivance for throwing off, as waste, all the water which falls for the first fifteen minutes in any continuous shower. In this way the dust, smoke, and floating impurities of the air, and such only of the rain-water as comes from purified air and from a well-washed slated surface, goes into the cistern for family use.

The very best surface for water-catching, remarks Mr. Hibberd, is slate and glass, and he thinks the latter will come into more general use as a substitute for tiles and slate. The importance of throwing away from house cisterns the first water which falls, in

towns and cities, is obvious ; and in the few cases of country houses covered with slate, where care has been taken by personal attention to turn off the first rain after a long drouth, the water in clean cisterns has been almost like clear spring water in appearance. The advantages gained are certainly worth all the care required, whether by the automatic apparatus, or by personal care at the time, in the purity of the water secured, and in its more entire freedom from all bad matter after filtering.

RESTORING THE ASPHYXIATED.—Charles Shepard, M.D. of Grand Rapids, Michigan, describes in the Detroit *Lancet* a method he has adopted for restoring the asphyxiated, when only newly born, but applicable to all ages, as follows : By raising the feet up and dropping the head down, and in a few seconds reversing the movement—head up and feet down. He repeats these movements about twenty times per minute. He believes the foregoing described plan or movements will be more effectual in restoring the asphyxiated (in whatever way produced) than any other ready method yet devised—not excepting Marshall Hall's or the one recommended by our State Board of Health. It is a plan applicable to all ages.

When the body is elevated to an angle of forty-five degrees or with the head down, the abdominal viscera fall against the diaphragm and force the air, mucus and all foreign matter from the lungs and air passages ; the blood also flows to brain, right side of heart and lungs, stimulating those organs. Reversing this movement, the abdominal organs fall away from the diaphragm, drawing it along with them. The air rushes into the lungs to fill the vacuum created. The blood flows to the right and left side of the heart and lower extremities, in this way imitating the normal movements of respiration and circulation as nearly as may be.

The details of the way how to execute the movements will suggest themselves to almost any one of ordinary sense. Children can be caught up in the arms of a person and the *movements* executed.

At life-saving institutions or stations an apparatus can be made consisting of a board or plank, upon which the patient can be placed and held (either on side or back) and the plank worked over a center, like the walking-beam of an engine. Various accessory means may be used, *especially heat applied to the surface*—holding the tongue from dropping back into the pharynx, etc., etc.

COMMON BUT TERRIBLE.—In a communication to the *Canada Medical Record* Montreal, Mr. J. W. Hughes, Sanitary Inspector, writes some of his experience as follows :

In continuance of my former correspondence, which gave my first case which referred to inspection of a country residence, I will now give a few cases from many in the city without comment, leaving your readers to form their own opinions. Visited lower tenement in yard of A. M., had 3 cases of diphtheria ; 2 fatal, one convalescent at time of visit. Smell in house very bad ; found sink pipes untrapped, wooden drain under floor, loose cover, soil swampy, house built on soil, filled tile drain, trapped sink wastes. Used disinfectants, but smell still continued, but in a less degree. On examing surroundings, found privy vault in yard full, and in close proximity to the house ; nature of soil allowed contents of vault to soak into ground under house. Reported facts to health department, who were powerless (as privy was without the distance from the house prescribed by law) except as to cleaning out of vault, which was done. What was left of the family moved away, leaving premises to be re-occupied by some one ignorant of the record of health against the same. House in B street, 3 cases typhoid, one fatal. Found drains open at joints, tiles broken, soil pipes leaky, no ventilation, no concrete under floors or other protection from damp ; locality and surrounding dwellings healthy. House in C street, 2 cases typhoid. Complaint of smell, difficult to find cause ; drainage and plumbing good, but no ventilation ; found small cracks in soil and waste pipes. House in D street, 3 cases typhoid, 2 fatal. Plumbing old but of a good class, but no ventilatilation ; found cracks in soil and waste pipes ; drains defective and joints open ; complaint of smell, which ceased on repairs being made, and ventilation provided for ; family been healthy since.

REQUIREMENTS OF PUBLIC SCHOOL BUILDINGS IN CITIES.—We take the following from the *Detroit Lancet*, as given by the *Sanitary Engineer's* prize committee : (1) At least two adjoining sides of the building should be freely exposed to light and air, for which purpose they should be not less than sixty feet distant from any opposite building. (2) Not more than three of the floors should be occupied for class rooms. (3) In each class room not cless than fifteen square feet of floor area should be allotted to each pupil. (4) In each class room the window space shoulk not be less than one-fourth of the

floor space, and the distance of the desk most remote from the window should not be more than one and one-half times the height of the top of the window from the floor. (5) The height of a class room should never exceed fourteen feet. (6) The provisions for ventilation should be such as to provide for each person in a class room not less than thirty cubic feet of fresh air per minute, which amount must be introduced and thoroughly distributed without creating unpleasant draughts or causing any two parts of the room to differ in temperature more than  $2^{\circ}$  F., or the maximum temperature to exceed  $70^{\circ}$  F. This means that for a class room to contain fifty-six pupils, twenty-eight cubic feet of air per second should be continuously furnished, distributed and removed during school hours. The velocity of the incoming air should not exceed two feet per second at any point where it is liable to strike on the person. (7) The heating of the fresh air should be effected either by hot water or by low pressure steam. (8) The fresh air should be admitted near the windows; the foul air should be removed by flues in the opposite wall. (9) Water-closet accommodation for the pupils should be provided for on each floor. (10) The building should not occupy more than half the lot.

EFFECTS OF COFFEE.—Dr. Richardson, the eminent English scientist, in respect to the popular notion that coffee is an unhealthy beverage, that it keeps up a constant irritation of the stomach, and brings on depression of spirits, etc. There was a great deal of truth in that statement, says the doctor, as coffee cannot be taken in excess without producing dyspepsia and irritation, *but moderately used it is an invigorating, healthful, and wholesome drink, bringing a man's best energies into play.* The quantity taken, however, must not be large, and should be good.

Dr. Broek, of Leipsic, another celebrated scientist, says: "The nervousness and peevishness of our times are chiefly attributable to tea and coffee; the digestive organs of confirmed coffee drinkers are in a state of chronic derangement, which reacts on the brain, producing fretful and lachrymose moods. Fine ladies addicted to strong coffee have a characteristic temper, which I might describe as a mania for acting the persecuted saint. Cocoa and chocolate is neutral in its physic effects, and is really the most harmless of our fashionable drinks.

SANITARY AUTHORITY AND HOUSE BUILDING IN ENGLAND.—The Nantwich, (Eng.) Rural Sanitary Authority have been invested with urban powers as regards new buildings in six of the largest townships within their district. Since these powers were conferred the plans of all new buildings have had of course to be approved by the sanitary authority before their erection could be commenced in the special districts alluded to, and in the three and a half years since the first plans were received plans of nearly four hundred new buildings have been laid before the Authority and have been passed. This means that some four hundred houses have been built on proper foundations; that damp courses have been introduced into their walls; that their ground floors have been laid at a proper level, and ample space left unbuilt upon about them; that each room has an opening window of suitable size, and that the ventilation is sufficient; that the best drainage that was practicable has been laid for the convenience of each house; that proper pipes and traps have been used; that the drains are properly ventilated, and that the dwelling is not in direct communication with them; that the subsoil will be drained if necessary, and that properly constructed ashpits and privies or earth closets have been erected at a sufficient distance from the dwellings, or, if water-closets are provided, that they are suitably situated and duly ventilated; that other necessary outbuildings are suitably placed; and that each dwelling has the best obtainable water supply.

THE NEWPORT SANITARY PROTECTIVE ASSOCIATION.—Newport, R. I., has the honor of organizing the first "Sanitary Protective Association" in America.—*Detroit Lancet*. Its objects are to provide its members with such advice as is needed to insure the proper sanitary condition of their own dwellings and those of their tenants, and to take such actions as shall improve the sanitary condition of the city. The association is really a mutual insurance company in the matter of health. The cost of membership for permanent residents is six dollars yearly. The business of the association is in the hands of a council elected by members of the association. The paid officers are a consulting engineer, an inspecting engineer and a chemical analyst. The remuneration of these officers is based upon the actual work performed. With the energetic Dr. H. R. Storer as a member of the council, the association cannot fail of attaining success. The objects thus sought all admit as in the highest degree

desirable. The method strikes us as practicable. We trust that the example of Newport may be initiated far and wide, by cities, towns and villages. To prevent disease is the keynote of the times.

Lynn, Mass., has already followed Newport in the above rational self-protection plan.

A NEW STUDY OF "VITAL STATISTICS."—Surgeon-General T. Graham Balfour, F.R.S., *Medical Times and Gazette*—always intimately connected with vital statistics of one sort or another—has recently been turning his attention to the "vital statistics of cavalry horses," and at the last monthly meeting of the Statistical Society he read a paper on this subject. It is surprising to learn from this, that in a horse-loving country like our own, the subject has received much less attention than in France; in fact, the information to be obtained respecting British cavalry horses is very meagre. On the other hand, in France, since the year 1847, twenty volumes of annual statistics had been published prior to the breaking out of the Franco-German war; and, taking into consideration the valuable results obtained by the statistical method of investigation as applied to the horses of the French Army, Dr. Balfour suggests that a similar course should be followed in our service, more especially with a view to test the actual value, as a measure of efficiency and economy, of the introduction into our cavalry of horses imported from Hungary.

DR. A. N. BELL of New York, Editor of the *Sanitarian*, at the recent meeting of the American Public Health Association said:—He sympathised deeply with the condition of Memphis, but he felt constrained to say, from his own observation, that he had never seen a city in such an abominable unsanitary condition as Memphis. Its condition was revolting, and the people of the city were deeply afflicted. In the epidemic of 1878, 20,000 people had fled from the city. Of 19,900 that remained, 17,600 had had yellow fever, and 1,150 had filled untimely graves. Of the 19,600 who remained in the city, only 6,000 of them were white people, and of these the enormous proportion of 4,204 died. 14,000 were colored people, and of these 946 died. He believed there was not one left in the city who had not divided his money with the sick and dying.

THE WATER-CARRIAGE system of sewerage, (the *Proceedings*) which for so many years has been accepted as the best method of disposing

of the refuse of cities, is rapidly falling into disrepute. The most recent attack upon it was made before the British Medical Association, by Dr. Andrew Fergus, a very eminent physician of Glasgow. He says, in effect, that the system is a failure, based upon an error in reference to the purifying properties of water. In respect of excretal matter, water has no power to purify it, or prevent its becoming a nuisance; it merely shunts it—takes it “from my door to deposit it somewhere else.” The system is destined to come to grief, not only because it is unsalutary, but because it is costly and wasteful.

VALUE OF ISOLATION IN INFECTIOUS DISEASES.—Dr. Edward Seaton, Medical officer of Health for Nottingham, has issued his annual summary on the sanitary condition of the district for the year 1879. The birth-rate for the twelve months has been 35·8 per 1000 of the population, which is equal to the average of past years. The mortality under five years of age was 41·3 per cent. of the total number of deaths, and this high rate is partly accounted for by the prevalence of measles and whooping-cough in the district, as well as of scarlet fever. The excellence of the results attained by the early isolation of cases of infectious diseases, combined with efficient disinfection, is shown in the fact that only in one instance out of seventy-nine did a second case occur, and this was under circumstances which made it extremely probable that the infection was taken from some other source.

EXAMINATIONS AND CERTIFICATES IN SANITARY SCIENCE.—Michigan is, we believe, the only place on this continent in which it is proposed to give certificates of having passed an examination in sanitary science, as in England. The Michigan State Board of Health announces that on July 14, the day after the next meeting of the board, it will, if candidates apply, examine them in sanitary science, giving a certificate of merit to those who pass a satisfactory examination. An outline of the plan of these examinations will appear in the forthcoming report for 1879.

IMPURE MILK AND INFANT MORTALITY.—In the *St. Louis Courier of Medicine*, Dr. P. V. Schenck writes as follows:—“From the statistics which I prepared as Health Officer, in 1874-5, it is clearly shown that in cities where swill milk is sold and in-town dairies allowed, the infant mortality is by far the greatest. The infant mor-



tality is greater in the West than in the East, greater in cities than in the country, greater in cities surrounded by grain-growing districts, greater in proportion to the number of distilleries, and greater in proportion to the use of swill food. The healthy city of Milwaukee, where we would think our children should be sent to avoid the enervating effect of high summer heat, looms up with an infant mortality of sixty-one per cent."

ARSENICAL POISONING.—The Council of the Society of Arts (*Med. Times and Gaz.*) having had their attention directed to numerous cases of reputed poisoning by arsenical wall-papers, and other articles in general household use, have appointed a Committee to inquire into the practicability of preventing the employment of arsenic in any process by which it is allowed to remain in finished goods, and to obtain evidence as to the effect of a total prohibition of the use of such processes, or the prohibition of the sale of articles produced thereby, would have upon various trades. To promote the object in view the Committee has issued a circular to manufacturers of colours, dyers, and others using colours in manufacturing processes, asking for information on certain specific points. One of the questions propounded in the circular asks whether any disadvantage would accrue to the manufacturer through a prohibition of the use of arsenic; but in any case the greater safety of the community at large is the main point to be insured.

NEUTRAL CHROMATE OF LEAD IN PASTRY.—(*L' Union Med.*) M. Personne, at a late meeting of the French Academy of Medicine, called the attention of the members to a new adulteration made use of by confectioners in the manufacture of cakes. This consists in the employment of the neutral chromate of lead, instead of eggs, to produce the golden yellow color of certain pastries and cakes. Suspicion was first excited by the exceedingly bright yellow shade of a certain confectioner's goods, a sample of which having been analyzed, was found to contain 73 milligrammes of oxide of lead in a 100 grammes weight of the article.

DISEASED MILK.—An eminent English chemist, says an exchange, recently read a paper before the London Chemical Society, in which he stated that the examination of a large number of specimens of milk had disclosed the fact that cows might be suffering from acute

disease of many forms without any change appearing in the milk which could be detected by the most careful chemical analysis. Notwithstanding this fact, the milk is in some way so changed by the existing disease as to occasion in many cases serious illness in those who make use of it as food. This fact shows the great care which should be exercised by those who make use of milk that the cows by which it is produced be in a healthy state.

STUDIOUS.—Schopenhauer, who was a vigorous hater of all noise, observes in a characteristic piece, “On Noise and Din” (*Ueber Lärm und Geräusch*), that people who are indifferent to noises are intellectually dull, being “insensible to reasons, to thought, to poetry, and art, and, in short, to mental impressions of every kind.” To this he adds—“The most intelligent and intellectual of all European nations has indeed erected the rule ‘never interrupt’ into an eleventh commandment.” There are instances of remarkable power of self-abstractation in students. “Mrs. Sommerville,” says Harriet Martineau “in her Autobiography, could write on a scientific subject amid a complete clatter of voices.”

HOT-WATER BOTTLE EXPLOSION.—At Birmingham recently an inquest was held on the body of a lady who was accustomed to warm her bed by means of a half-gallon stone bottle, which, being filled with water was heated in the oven. On the 7th ult. the bottle, which was tightly corked, was left in the oven, and in the evening the deceased was lifting it out to carry it upstairs when it suddenly exploded, and she was severely injured about the head, receiving, besides other wounds, a compound depressed fracture of the skull and a fracture of the upper jaw. On the 26th she died from exhaustion produced by the injuries she had sustained.

THE TOTTENHAM SANITARY ASSOCIATION.—The Tottenham Sanitary Association, which, it will be remembered, is a local body established to watch over the sanitary condition of the parish, has recently issued its sixth annual report for the year 1879. The annual death-rate was only 16.9 per 1000. An indication of the rapid increase in the population of Tottenham during 1879 is afforded by the increase in the number of births, which have risen about 18 per cent. In twelve of the other suburbs of London the increase in the birth-rate is less than 6 per cent.

VITAL STATISTICS OF SCOTLAND FOR THE QUARTER ENDING DECEMBER, 1879.—The Registrar-General for Scotland has recently issued his quarterly return for the period ending December 31 last, from which it will be gathered that 30,064 births and 17,408 deaths were registered during the last three months of 1879. These figures represent an annual birth-rate equal to 33·2 per 1000 and a death-rate equal to 21·9 per 1000. On an average 326·78 births were registered daily throughout the quarter. The mortality from all cases was 1808 in October, 1894 in November, and 2897 in December, and may be regarded as unusually moderate. The deaths from zymotic diseases constituted about 16·1 per cent. of the total mortality, indicating no particularly unfavorable condition of the health of the principal towns. Diseases of the respiratory system caused 309 deaths in October, 435 in November, and 956 in December. Of all the deaths from specified causes fully 26·3 per cent. were referred to diseases of the respiratory system; and nearly 18 per cent. were attributed to bronchitis alone.

WHEN NOT TO EAT.—Never eat when very much fatigued. Wait until rested.

Never eat just before you expect to engage in any severe mental or physical exercise.

Never eat while in a passion, or while under any great mental excitement, whether of a depressing or elevating character.

Never eat when in a hurry, if you can prevent it. If obliged to eat hurriedly, eat lightly.

Never eat just before taking a bath of any kind.

Never eat just before retiring for the night.

Never eat between regular meals.

LONGEVITY.—The London *Times* has lately contained in its obituary some remarkable illustration of prolonged existence—notably so on the 6th inst., when the deaths of five ladies and three gentlemen were recorded, whose united age 674 years, giving an average of eighty-four years and three months to each. The eldest, as usual, was a lady who had reached the great age of ninety three; the youngest of the same sex was eighty-one; of the gentlemen the oldest was eighty-seven; and the youngest eighty years of age. There were also fifteen septuagenarians, averaging seventy-five years each.

**COST OF THE RUSSIAN PLAGUE.**—It will be of interest to make known some of the details of the “budget” of the plague of Astrachan, and of the measures taken to prevent its recurrence. The epidemic, which was near cutting off Russia from the rest of Europe, cost altogether about two million francs, the expenses, being calculated from January, when General Loris Mélikoff was named Governor-General, until April, when all danger had disappeared. The sanitary cordons and quarantines cost 100,000 fr. ; the watching isolating suspected places on the Volga, 60,000 fr. ; the medical *personnel* and payment of *employés*, 250,000 fr. ; medicines, &c., 90,000 fr.

A DOCTOR went out West to practice his profession. An old friend met him on the street one day and asked him how he was succeeding in his business.

“First rate,” he replied. “I’ve had one case.”

“Well, what was that ?”

“It was a birth !” said the doctor.

“How did you succeed with that ?”

“Well, the old woman died, and the child ; but, by the grace of God, I’ll save the old man yet !”

**AT THE AUTOPSY.**—Three physicians met together to consult, at the sick-bed of General X. After they go the General rings for his man-servant :

“Well, Jaques, you showed those gentlemen out ; what did they say ?”

“Ah, General they seemed to differ with each other ; the big fat one said, they must have a little patience, and at the autopsy—whatever that may be—they would find out what the matter was.”

THERE is but one proper cosmetic, and that is pure soap and water—not scented soap, but pure soap. Scented soap is only needed to hide the offensive smell of an unhealthy skin ; if the skin is kept healthy by regular washing, no scent will be wanted, and both blonde and brunette may be satisfied that the beauty which they will then possess and rightly rejoice it is the work of nature, and not the result of paint.

## EDITORIAL NOTES.

IT IS hoped that any inaccuracies or defects in this number of the JOURNAL will be kindly overlooked by the reader, as the editor has just suffered a terrible family affliction in the illness and death of his wife.

THIS, THE sixth bi-monthly number, is the last number of this volume. Any wishing title page will please send a P.O. card with address. We trust those in arrears for the volume, and there are yet many, will kindly send in the amount due.

BILLS WILL be sent with this number to those who have not paid up to date, and we beg they will favor us with the amount at an early day and save us the trouble and expense of sending bills again.

THE PUBLISHER expects to complete arrangements by which the JOURNAL will be considerably improved in many respects, on commencing next volume in July. It will be published monthly again it is hoped,—a monthly being most liked—and with double columns; and probably the price will be reduced to \$1.50.

## BOOK NOTICES:

MEDICAL CHEMISTRY, INCLUDING THE OUTLINES OF ORGANIC AND PHYSIOLOGICAL CHEMISTRY, ANALYSIS OF URINE, URINARY SEDIMENTS AND CALCULI; ALSO, GENERAL CHEMICAL PATHOLOGY. By C. Gilbert Wheeler, Professor of Chemistry, University of Chicago. Chicago, S. J. Wheeler.

This is a volume of over 400 pages, and is devoted exclusively to the outlines of medical chemistry, and is intended to set forth in a concise method and form such matter as will be suited to the wants of the student of organic and physical chemistry. The subjects treated have hitherto received comparatively little attention from medical students and physicians, and the necessity for a work of this character will be recognized by the profession. Throughout the work prominent and recent authorities are quoted, and judging from the articles we have particularly examined, we should say that a very fair summary of the latest and most reliable information is given. The first part of the work is devoted to organic chemistry; the second especially to physiological chemistry, in which the subjects of digestion, absorption, the analysis of the various fluids of the body, respiration and kindred subjects are treated of in a concise and interesting manner. The subject of urine analysis is treated in a careful manner, which says much to the value of the work.

MUSCLE-BEATING; OR, ACTIVE AND PASSIVE HOME GYMNASTICS. With illustrations. New York: M. L. Holbrook & Co.

The author says in his introduction "I am in a position to prove that we can act more powerfully on different chronic morbid deposits (as the periphery of the body) with beating and tapping than with iodine or electricity, &c. It is really very difficult to understand why the Faculty has not paid more attention to this matter.'

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