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# THE SANITARY JOURNAL,

DEVOTED TO

## PUBLIC HEALTH.

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### Original Communication.

#### CIRCUMSPECTIVE REVIEW OF HYGIENE.

Medicine may be defined as a science which has for its aim the promotion of health and the cure of disease. Egyptian medicine may fairly be classed in the first place. We read in the Bible that when Jacob died "Joseph commanded his servants the physicians to embalm him, and the physicians embalmed Israel, and forty days were fulfilled for him." The body, it would appear, required this number of days to complete the process. Moses having delivered the law against drinking wine, in Leviticus, 10th chapter, 9th verse, proceeds to deliver a series of Hygienic ordinances. In chap. XI. he treats of unclean (indigestible) meats, or those calcu- lated in hot countries to be promoters of cutaneous, scrofulous, and scorbutic disorders. In chapt. XII, XIII, and XIV., he treats of unclean persons, garments, and dwellings. In Chap. XVIII. he treats of unclean matrimonial connexions, the prohibited degrees specified from the 7th to the 17th verse inclusive. In the 25th verse, by a strong figure of speech he represents the results of indiscriminate marriages, and other abominations. In the 19th chapter 19th verse, he would appear to have reference to the avoiding of costly and fashionable garments, as ministering to luxury and effeminacy. On this subject Chaucer, in the "Parson's Tale," thus delivers

a sermon against luxury in dress :—“ As to the first sinne in superfluitie of clothing, such that maketh it so dere, to the harme of the people, not only the cost of embrauding, the disguised indenting, or barring, ounding, paling, winding, or binding, and semblable wast of clothe in vanite. But there is also the costlewe furring in their gouns, so much pounsing of chesele, to make holes, so much dagging with sheeres foorth ; with the superfluitie in length of the foresaid gouns, &c., &c.” See page 198. From Champilion, as also from ancient writers, we learn that before the emigration of the sons of Jacob into Egypt, the arts and sciences had already attained in that country a degree of perfection which could only be the result of long experience, that required many centuries of observation.

Thoth or Theyt, whom the Greeks name Hermes, and the Latins Mercurius, passed among the Egyptians as the inventor of all sciences and arts. According to many conjectures this personage was identical with Bacchus, Toroasler, Osiris, Isis, Serapis, Orus or Opollo or Shem the son of Noah. B. Constant finds a way out of this difficulty by propounding the theory following :—“ In the great religious corporations,” says he, “ the sacerdotal instinct warns them never to permit any individuality to be manifested. What we have taken for the proper names of the Chaldean and Phenician writers, was probably only the designation of a class. Many East Indians have assured the chevalier Jones that Budda was a generic name. In Egypt all the works on religion and the sciences bore the name of Thoth or Hermes.” Houdart, in his “ *Etudes Historiques et Antique*,” agrees with this last view. He says :—“ It is not necessary to suppose that medicine reached suddenly in Egypt a degree of perfection.” As was common among other people of high antiquity, they commenced in the first place, as we learn from Strabo, by exposing the sick in public, so that any of those who passed by, that had been similarly attacked, and cured, might give their advice for the benefit of the sufferers. At a later period, all who were cured of disease were required to go and make an inscription in the temples, of the symptoms of their disease. and the curative agents which had been beneficial to them,

The temples of Canopus and Vulcan at Memphis became the principal depots of these registers, and they were kept with the same care as the archives of the nation. The priests, who were charged with the study of these observations, did not hesitate to seize upon the exclusive practice of the art, and when they had collected a grand mass of facts, they formed a medical code, the fruit of the experience of ages, which is called by Diodorus, of Sicily, the Sacred Book, from the directions of which they were never permitted to vary. Renouard in his "Histoire de Medicine," gives a minute account of the practice of embalming by the Egyptians, and clearly shows that it was calculated to familiarize the Egyptian priests of that early day with anatomical research. Moses, rescued by one of the daughters of Pharaoh, was reared in the court of that prince and instructed in all the knowledge of the Egyptian priesthood in which he became a proficient; his writings constitute a precious monument for the history of medicine, for they embrace hygienic rules of the highest sagacity. The Bible prescribes frequent ablutions necessary in all, but particularly in hot dry countries. It would appear from the 13th of Leviticus that Moses gave his instructions concerning leprosy and other infirmities to the priests only, from which it may be inferred that the Levites joined the practice of medicine to their sacerdotal functions. It appears that they maintained for a long time this double relationship to society, for there is no mention made of lay physicians among the Jews, except in the book of Ecclesiastes, the author of which lived in the third century before Christ. The following references are made on this subject in the XXXVIII. chapter, verses 1, 2, 3, 4. Hygiene under the Ptolomies Ptolomy Soter and his son and successor Ptolomy Philadelphus, the leaders of the Alexandrian school, did not progress as rapidly as Anatomy and Physiology, nevertheless, it was not entirely stationary. Celsus has recapitulated in his first book the most accredited hygienic precepts of his time. He commences by addressing some general councils to men in robust health. Then he explains, more at length, the regimen which is suited to persons in delicate health, among whom he classes

the greater part of the inhabitants of cities, and in particular men of sedentary lives. His prescriptions relate principally to the choice of food and drinks, the use of baths, the alternation of repose and labor, the repast, gymnastic exercises, artificial dejections excited with a view to health either upwards or downwards. Hippocrates and his successors, in the schools of the Asclepiadæ, who owed their first scientific instructions to Egyptian priests, gave special attention also to hygiene. Their writings comprise a treatise on airs, waters, and places; 2nd, a treatise on regimen divided into three books; 3rd, a treatise on salubrious diet.

Hygiene, during the Reform period comprising the 17th and 18th centuries was considerably extended, becoming the object of meditation not only of physicians but also of philosophers and learned men of all classes, and governors and statesmen, who endeavoured to ameliorate the condition of the physical life of the nations, and teach them more salutary habits. Renouard in treating on this subject divides hygiene into two great sections accordingly as it refers to man living in society, or as an isolated individual. I quote from his work, page 406. "The founders of Greek cities drew from Egyptian sources a part of their religious rites, and their hygienic customs, to which they added improvements, among others they instituted the gymnasium. In Rome, gymnastics took a worse direction for it was abandoned to gladiators and slaves, who alone combated in the circusses. The baths became, also, under the emperors, objects of luxury and effeminacy rather than salubrity. But the construction of aqueducts, fountains and sewers, the maintenance of cleanliness in cities, the attention to the location of cemeteries without the limits of the town, and the importance of which was attached to the duties of magistrates, all attest that the earlier legislators of the sage people did not neglect the care of the public health. Vitruvius, architect to the Emperor Augustus, is worthy of being consulted, not only as regards the perfection of edifices, but also in regard to their salubrity. He gives next to Hippocrates, the best precepts on the location of cities. He recommends that cellars and granaries be

constructed on the northern side, because a southern exposure is "unfavourable to the preservation of stores." It was at the beginning of the 17th century that the Governments of Europe seriously occupied themselves with the duties of attending to the public health. A lazaretto was established at Marsilles to prevent the spread of the plague from the East. John Howard, the philanthropist, embarking for Lisbon immediately after the great earthquake in 1756, was captured by a French privateer. The suffering which he endured and witnessed during his confinement struck deep into his mind. The impression was renewed when, as Sheriff of Bedfordshire, he had charge of the prisons of that county. Shocked by the misery and abuses which prevailed, he set to work to enquire into the nature and remedy of the evil. In that year he visited, in two journies, most of the town and county gaols of England, and accumulated a large mass of information, which in March 1784, he laid before the House of Commons. This was the commencement of prison reform in England; for in the same session two acts were passed, one for relieving acquitted prisoners from payment of fees, the other for preserving the health of the prisoners. To the labours of Lady Wortly Montague, of Jenner, of Count Rumford, and a host of others in this good work, allusion will be made in the next number.

Simcoe.

C. W. C.

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## Selected Articles.

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### THE WASTE OF LIFE.

*From an address delivered before the American Medical Association, at Detroit, June 4th, 1874, by A. N. Bell, M.D., Chairman of the Section on State Medicine and Public Hygiene.*

"IT IS HELD IN LAW THAT WHOEVER ACCELERATES DEATH CAUSES IT." (TAYLOR'S MEDICAL JURISPRUDENCE, AMERICAN EDITION, 1861, .p. 470.)

Progress in measures for the protection of human life consists in exposing the consequences of their neglect. The

fall of a frail structure in Brooklyn a few weeks ago, overwhelming nine or ten men in the ruin, killing three outright, and wounding several others, shocked the whole community. Policemen and coroners rushed to the rescue; his Honor the Mayor, the Health Commissioners, the contractors, and the undertakers vied with one another in their lively sense of the catastrophe. And the action of the Common Council was invoked to prevent the recurrence of such an accident in the future. Such is the natural horror of death when suddenly brought face to face with small motives. Three days later, in the same city, a whole row of half-built houses tumbled down, involving much greater loss to the contractor than in the former case, but as there happened to be nobody in them at the time to be killed, the circumstance attracted but little notice; it was only an unfortunate accident to the contractor—an incident to his occupation. These are fair examples of common occurrences of carelessness in regard to the safety of human life throughout the country. Occasionally one, extraordinary for the number of its victims, happens, such as that of the Mill River disaster, and it is for a time made the theme of pulpit eloquence. Mill dams everywhere are held up as suspicious structures, liable at any time to break away, and demonstrate, to the satisfaction of those who build them, the uncertainty of human life.

It is the same when lengthened steamships founder amid ocean, as in the recent disasters of the French line; or when boilers burst, as in the ferryboat Westfield; or when railroad trains dash along to fatal collisions and over embankments. Public indignation is for a time excited. Investigations are undertaken, and lengthy publications of that which everybody knew before, that in the construction of such works the protection of human life has received little or no consideration whatever; that the necessity for it has not been imposed as an obligation of the civil authority, nor adequate punishment for its neglect inflicted. But these after all are only the minor degrees of crime in this direction. The danger of imperfect structures to human life is pervading. Palatial dwelling-houses are not unfrequently erected over old burying-places, vaults, and cesspools, and within provided with all possible accessories for the retention of the poisonous gasses evolved from the soil, in addition to the foul air generated by their occupants. Assembly rooms and theatres are usually no better. And exquisitely finished churches, where mill dams and other death-dealing agencies are made odious, are not uncommonly constructed with so little regard to ventilation

as to be dangerous sources of disease. Country dwelling-houses, with beautiful exterior relations of shade trees and verdure, but with neglected graveyard proximities and other death streams beneath and around, with privy vaults, cesspools, and wells all in proximity are the common nests of typhoid fever all over the country. The indispensable requisites to health—an abundant supply of pure air and pure water—receive but little recognition and are rarely provided for.

School-houses, public and private, are a disgrace to human nature. Situated, constructed and furnished with utter disregard of the nature of the soil, exposure, air and light, they are in effect systematic institutions appropriated to the nurture of disease and the acceleration of death. With reading lessons recounting the horrible act of the half-civilized nabob of Calcutta more than a century ago, and the no less barbarous act of the captain of the emigrant steamship Londonderry twenty-five years ago, and school physiologies teaching that each individual requires for healthy respiration 2,000 cubic feet of air hourly, notwithstanding these instances and this patent knowledge, examples are not wanting in the public schools of our large cities where the air-space appropriated to each individual is less than 50 cubic feet and with little or no provision for change. Literally, schools for the growth, culture, and promotion of scrofula and consumption, and the hurdling places of the infections of childhood. Three hundred cubic feet of air space, with efficient provision for change three times an hour, is the lowest possible estimate which should be allowed. With less than this, the air speedily becomes poisonous, and the active nidus of infection.

Tenement houses are notoriously situated without regard external relations of soil, air and light; and within, from sub-cellar to garret, curious for their ingenuity as architectural imitations of the bee for space, but wholly devoid of that insect's instinct in regard to cleanliness and ventilation. \* \* \* The occupants of such dwelling-places become an easy prey to the sensual excitements of alcohol and other debasing agencies and influences. As people become accustomed to dirt, they cease to recognize its presence and to exert themselves to avoid it; there is no limit to the downward tendency. The same broad road to disease and death is the highway to moral degradation. And that such an institution should breed disease and death; that it should be the hecatomb of children; that it should sustain liquor stalls by the thousand, and supply the ghastly gaiety which flaunts beneath the gaslight and makes night hideous; that it should send the boys who escape



the slaughter to State Prison ; that the tenement house should do all these things, and more than words can utter, is perfectly consistent with its appointments. \* \* \* Is the tenement house a christian institution, or a heathenish ? Who is responsible ? Is there, indeed, *no* responsibility for moral and physical degradation ; *no* responsibility for deliberate provision and business speculation in human life ; *no* responsibility because tenement-house property pays better than any other real estate ? State Medicine and public Hygiene ! The lesson is yet to be taught in this country that man has no right to poison his neighbour ; that to poison the air for his neighbour to breathe is no less criminal than to poison his food or drink ; that to smother children in schools and tenement houses, as in other places, is infanticide ; that to accelerate the death of any individual is to cause it, and that the crime is homicide.

The mortality of the United States for 1870 was 492,263. A glance at this tabulated estimate in the Census report will show that about one-half of the total number of deaths were caused by the diseases due for the most part to miasms consequent upon soil saturation and stagnant water. That from consumption alone there were 69,896 deaths. From enteric, intermittent, remittent, and typho-malarial fevers, and cerebro-spinal meningitis, there were 34,521 deaths. Rheumatism, acute pulmonary affections, croup, diphtheria, and many other diseases well known to be largely due to or promoted by the same cause, may, for our present purpose, be left out of the count. Of the 69,896 deaths from consumption, and 34,521 deaths from ordinary miasms, three-quarters of them, at the least, or more than 75,000 lives, might have been saved by drainage. For illustrations of the results of defective drainage, it is more difficult to go amiss than to designate.

Since writing up the subject for the city of Brooklyn and county of Kings, for the report on the State of New York, Dr. James Watt, Registrar of Vital Statistics to the Brooklyn Board of Health, has kindly prepared for me a table showing the comparative mortality from consumption in the different wards of the city. Its full value to Brooklyn can be appreciated by those only who are familiar with the city topography, while it illustrates conditions common to all our large cities.

Take, for example, an old and well-built up ward (the Third), containing a population of 9,984, which is not known to have any soil saturation, its situation being such that the ordinary street grading and sewer culverts effectually drain it. The deaths from consumption in this ward last year were

fourteen; or 1.40 per 1,000 of the population. An adjoining ward (the Sixth), with a population of 28,296, of corresponding large area, however, it being even less densely built up than the former, but about one half of it subject to soil saturation, had of deaths from consumption, 171, 6.04 per 1,000 of population. Sixty-one of these deaths occurred in hospitals situated in this ward, and were in part from other wards. But after deducting the whole sixty-one, there still remain 4 per 1,000, or nearly three times as many deaths per 1,000 of population from consumption over this area of soil saturation as in the one devoid of it.

Of malarious and zymotic diseases generally, the deaths over the non-saturated soil (of the Third ward) were 2.40 per 1,000 of population. From the same diseases in two soil-saturated wards (Twelfth and Eighteenth) extending over a large area, and for the most part sparsely built up as compared with the non-saturated area, there were 9.86 per 1,000 population, or nearly four times as many. I might thus go over the whole city and show the influence of soil-saturation on the mortality; point out the neglected natural soil saturation in one place, and the carelessly constructed soil saturation in another.

The total number of deaths in Brooklyn last year was 10,968, and not less than one-fourth of them were accelerated by defective drainage. And yet Brooklyn is no exception in this regard. On the contrary, the death-rate of Brooklyn compares favourably with other of our large cities. \* \* \*

Wherever misery, disease, and short life predominate, there always exist at man's disposal the means of relief; to find out and apply these means is the exercise of sanitary science.

It becomes our duty as sanitarians to show the authorities that it costs less to have human habitations constructed with regard to the protection of life, with provision for an abundant supply of pure air, water, and light; paved, and cleanly streets; efficient drains and sewers,—than it does to neglect these provisions; that imperfectly constructed houses, mill-dams, steamships, and other human habitations and highways, all fall under the category of neglecting measures, accelerating death.

It is not the nature of mankind that evils at war with his well-being should be scattered broadcast, or exist anywhere within the scope of intellectual development. Selfishness and barbarism are noxious agents everywhere, and as such they should be treated, for it is neither the nature or the

habit of the human constitution to become so accustomed to conditions inconsistent with the highest state of human progress as to be unaffected by them. The highest state of human culture furnishes the only standard by which the degree of elevation should be measured; and cleanliness and refinement bear the same relation to each other in the progress of human culture as do filth and moral uncleanness in the degradation of uncivilized communities. The miserable, degraded, and sickly portion of every community is weak, in proportion as the highly cultivated and healthy portion is strong. To assist the weak in applying such measures for the preservation of life as will protect mankind at large from the injuries which each individual in a narrow-minded selfishness would inflict on his neighbour, is the first and most sacred duty of a paternal government. Contact with well-cleansed streets, and external purity generally, creates a distaste for internal filth and degradation, and there are none so degraded or so impure as not to be benefitted and elevated by association with kindness and cleanliness.—*Sanitarian*.

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### ENTERIC OR TYPHOID FEVER AND SANITARY ADMINISTRATION.

By JOHN M. FOX, Medical Officer of Health to the Cockermonth Union, &c.

Small-pox may be regarded as a scourge of the past rather than of the present. The one remedy for it, or provision against it, is universally acknowledged, and a separate national establishment is devoted to its supply.

Cholera is a disease with which happily we are not allowed to become familiar by every-day experience. Its devastations, when it is present among us, are very sad; and may be compared to the havoc of an exceptional interval of war. But during the longer normal periods of peace its name does not appear in our statistics of public health.

How different is the case with typhoid fever! For it we have no prophylactic provision. Nor is it an obsolete or even an occasional visitant. The following considerations seem to give to this affection an overwhelming interest to sanitary authorities and their officers. Indeed, I would regard it as the test disease of their activity or of their success. Where there is no typhoid fever there is good water, efficient drainage, and a careful inspection of the habits of the poor.

1. To continue the comparison, typhoid fever is a peace disease, being really never absent from us. In the most

mysterious and unexpected manner it is ever cropping up amongst rich and poor, the bane both of urban and rural sanitary authorities. A metropolitan water company, or a complicated, well-engineered sewer system affords no exemption; nor, on the other hand, does the country well, or the isolated farm-house. But, as I shall mention by and by, these things ought not so to be. Where typhoid fever occurs (and it never ought to occur) there is sanitary oversight or sanitary neglect, or want of power either in the provisions of the Legislature or the application of those provisions by the local board, to ensure plainly-understood sanitary conditions.

2. And yet typhoid fever is far from being a trifling or unimportant disease. The medical officer of the Privy Council, in his annual report (1867) to the Lords of the Privy Council, prepared according to the Public Health Act of 1858, for their presentation to Parliament, states that in round numbers from fifteen to twenty thousand persons are annually slain by typhoid fever alone; and that perhaps twenty times that number, or nearly four hundred thousand of our population, are grievously sickened and endangered by this complaint. Surely this is lamentable enough; but it will appear more so if we remember that—

3. These persons, thus killed, or so long “unable to work,” are not the constitutionally cachectic or idiotic, who, in an economical point of view, might be better spared than others. They are the rank and file of the working army of the nation. Artisans, whose families are often left chargeable to the parish, lawyers, doctors, parsons, statesmen—even royalty itself—all, in their proportion, contribute to make up the disastrous list of deaths and enfeeblements.

4. Nor is typhoid fever in any sense, according to any theory or superstition, a disease which, once in life, a person is supposed to have to “go through.” The absurdity is seen at once of undergoing any operation analogous to vaccination as a preventive of typhoid fever. Night soil men are mentioned as being fortified by use against the contagium of typhoid; but an apprenticeship to this occupation is a remedy hardly likely to be tried on a large scale. To undergo an operation, indeed, or to propound a remedy, to make us proof against the influences of dirt seems at variance with the ideas of modern civilization, even if it could ever be practicable.

5. And this brings me to the next consideration, showing the paramount interest which typhoid fever possesses for the sanitarian, namely, that it is directly and positively preventable in a way that comes specially under the scope of a sanitary authority. “Tolle causam” is a very ancient medical

precept, and it is the only one applicable or necessary in the present case, but not in a manner that comes under the province of the private medical practitioner. His attention is otherwise engaged; But not so the public health officer. It is humiliating, perhaps, to think that the occupation of a sanitary authority should be so much directed to this subject. But if it is a humiliation attached to an inherent and ever operative condition of humanity, it is wise to revolt? This is no sphere for sentiment or æsthetics.

I assert, fearless of contradiction, that the resolute, unremitting, impartial, and universal dealing with filth is equivalent to the extirpation of typhoid fever. Is this or is it not a desirable and worthy end? And is it not the function, *primus inter pares*, of a sanitary authority? The Amended Nuisance Removal Act is as old as 1855, and what is it but an explicit enlargement of certain parts of the Local Government Act of 1848, and what is that Act but a consolidation of statutes on this subject dating, perhaps, from the Plague of the seventeenth century?

I repeat, then, that typhoid fever is our present unintermitting scourge in one place or another; that its cause is amongst the fixed and proven facts of sanitary science; and that it is, therefore, the duty of a sanitary authority, under sufficient enactments, ever to be dealing in earnest with this cause. Filth, polluting air or water, or both, is the sole, simple, and removable cause, and the removal of filth in such a way that neither air nor water shall be polluted thereby, means the extinction of typhoid fever. This is as true, and, with present machinery, as practicable as that vaccination, universally applied, signifies the extermination of small-pox. In regard to the present water supply, the maxim must be differently stated, in consequence of past pollutions of soil. Potable water, in accordance with the above axiom, must be brought from a source to which the filth of previous ages or of present drainage has no access. In one word, filth must be removed; water must be imported.

But is the cause as simple and well-ascertained as stated above? I doubt whether it will be disputed. Buhl and Pettenkofer speak of the height of the sub-soil water as being casually connected with outbreaks of typhoid fever. But Dr. Buchanan has pointed out that this relation is merely one of coincidence and accidental; the efficient cause being found in the drinking water. Mr. Simon in his report already quoted, speaks of typhoid fever as "a disease which solely prevails through the pollution of atmosphere and drinking water with

excrement" He says also, "the result of an investigation relating to 25 towns, with an aggregate population of 60,000 inhabitants, was to show the exemption which local populations obtain from cholera, typhoid fever, and other endemic bowel affections, in proportion as the local soil, air, and water are kept free from excremental pollution; a result so confirmatory of much other evidence previously collected of the same etiological question, that henceforth apparently not even the most unwilling witness can deny the relation of the cause and effect in that matter." Dr. Parkes, in his work on Hygiene, 1873, says that "the prevalence of typhoid fever stands in a close relation to the imperfection with which sewage matters are removed;" and speaking of the specific cause of typhoid, he sums up a collection of evidence in these words:—"Fecal effluvia, and fecal impregnation of water, are the channels by which this specific cause reaches the body of a susceptible person."

It will be observed, that the difference of opinion as to the exact nature of the contagium is quite beside and beyond the simple and all-important fact just stated,—all-important, that is in a sanitary point of view,—namely, the essential connection of fecal pollution with the occurrence of every outbreak or single case of typhoid fever. Whether the poisonous emanation has the action of a ferment according to the older notion, or is an independent animal existence of a fungoid or even lower kind, and whether these fungi, or microzmes, live and grow and die in the body or are merely vehicles of the contagium, these are questions upon which I am not competent to speak. Nor is it necessary for my present purpose. What it is of practical importance to know is, that the detritus of Peyer's glands contains the contagium. This detritus is thrown off in the excrement. The contagium thus passes into the air or into water, and by breathing, air-swallowing, or drinking is conveyed into the system.

I now come to a very important inquiry connected with the origin of typhoid fever, namely, whether in a case of fecal pollution of air or water, the presence of evacuations from a typhoid fever patient is necessary in order to produce the specific disease we are considering. It is evident that the medical officer of the Privy Council (see recent reports) and Dr. Parkes incline to the belief that the presence of typhoid evacuations is necessary; though both admit the many difficulties which oppose themselves to such a hypothesis.

I may say at once that this seems to me to be a view

quite at issue with a large and increasing multitude of facts. Nor is it as yet supported or demanded by science. \* \* \*

It would be deplorable, if the view became popular, that only typhoid or choleraic discharges were source of imminent danger. In this way a powerful motive to action would be taken out of our hands. According to the view I am now combating, the case would stand thus:—Typhoid stools, if exposed, beget typhoid: ergo, do not expose typhoid stools. On the other hand, our argument would be, filth, if exposed, begets typhoid: ergo, do not expose filth.

The matter was well summed up by Sir William Gull, in a lecture delivered at Guy's Hospital, June, 1872. He says:—"There is a scientific theory, but there is a good working theory on the point. The origination of the disease is somehow or other connected with drainage. It has, therefore, been called the filth fever. Hence, to get rid of the filth is to get rid of the fever." These are admirable words which should be reiterated to, until they are heeded and acted upon by, every sanitary authority in the kingdom.

It is not at variance with this view, to admit that the poison comes to us in the most concentrated form (and perhaps it is a mere question of concentration) in emanations from the discharges of a typhoid patient, and the fearful increase of danger thus arising should also be borne in mind as a motive to action. Sound sanitary advice would therefore assume this form:—Beware of sewage contamination in regard to water; or sewage exposure in regard to air in any case; but, additionally, because the fatal typhoid contagium may be there with its enormous power of diffusion, though we may not know it. It is on this account that a single disinfected privy over a stream, or in a court (of which I shall speak again by and by), may be a source of danger. Bearing upon this point, I may just mention how many persons not unfrequently have typhoid fever, and therefore all the power and facility of propagation to others, and do not even suspect the presence of so serious a malady. We have all attended patients who have not gone to bed for the first fortnight, or perhaps during the whole period of an attack. The persistent headache and lassitude, with more or less bowel affection, are often thought to be the entire illness. But though so slight a malaise in one case, it may be the very plague in its offspring.

I have been led to make these remarks upon the causation of typhoid, from the fact that it has been my duty, during the summer and autumn of last year, to investigate several outbreaks of this disease in isolated villages and farm-houses

situated in the Cockermonth Union. In some I have been able to trace the origin to the discharges of persons previously affected. But in several, though I have made a special effort to do so, I have failed to discover any history of contagion or importation, or any direct typhoid impregnation. In every case there has been fecal pollution of air or water, but in many, fecal pollution of no assured specific character. It is unnecessary to make extracts from my journal, as such cases are familiar, and many are adduced in every work on the subject.

I do, however, propose to furnish brief notes of two or three selected cases, as suggesting the idea that neglected and festering farm-sewage, in close proximity to a dwelling, may be an efficient cause of typhoid fever. As this possible source of danger has not been generally noticed, and is not mentioned by Dr. Parkes in the recent edition of his exhaustive work on Hygiene, I therefore refer to it with diffidence. If it be shown to be untrue, the negative statement will be of some value in clearing the ground in future investigations. But if the observations of others are found to be in harmony with my own, it will be in the interest of a large class of population, in the rural districts, that the cause I have indicated should receive public attention.

June 16, Dovenby.—Four cases of typhoid fever in one farm-house; one fatal. No history of importation or infection. Privy far away from pump; but liquid manure from farm running down a badly paved yard, and left standing about all round the pump, which supplies drinking water. Directed other water to be used, and well opened. June 26.—The inspector reports:—Well opened, and a pipe for overflow so broken as to have been conveying liquid sewage into the well. Not another case in the village before or since.

Nov. 5.—Six cases of typhoid fever at Little Clifton; confined to one farm-house, and adjoining cottage. No other case in the village. No history of importation or infection. Water not polluted. Privy thirty yards from house, and separated by a garden. Cause, supposed to be a large collection of liquid manure and washings of cattle excrement in farm-yard, close to the house. I subjoin one paragraph from my report to the Rural Sanitary Authority upon this outbreak:—“I have only three observations to make on this part of the subject: one is, that typhoid fever is always associated with absorption into the system of pollution either in air or water as its originating cause; second, that this large, open, animal cesspool, which I have just described, has been shown to be the only source of such pollution applicable



in the present case ; and third, that upon no point has medical testimony been more unanimous in this neighbourhood, than that typhoid fever is remarkably present in farm-houses in this district. In fact it has been mentioned to me as a matter for inquiry on my part, as medical officer of health, that from some farms which have been named to me, though healthily situated, and standing apart from towns and town pollutions, typhoid fever is seldom absent. Therefore, taking the former facts in connection with this testimony, I have no difficulty in arriving at the conclusion that the accumulation of liquid and solid manure, in close proximity to a dwelling, is a nuisance injurious to health, and to be dealt with accordingly, being a manifest occasion, as proved in innumerable instances, of the development of that most calamitous of all preventable diseases, typhoid fever. My future practice and advice will be in harmony with the axiom just laid down." I may mention that three of these cases terminated fatally. The above report has been printed by order of the Board.

December 3.—Similar outbreak in farm at Great Clifton. Water pure. Case identical in all respects with above.

I might multiply such cases freely, but the above will suffice.

The conclusion, then, that I would draw is this: that in the present state of our ætiological knowledge we are not justified in supposing that positive typhoid excreta are necessarily to be looked for in an outbreak of typhoid fever ; on the other hand, that decomposing excrement of man or animals, allowed to remain exposed in atmospheric influences near a dwelling, may be productive of that disease in a virulent and fatal form. This, I take it, is the "working theory" on the subject, to which our powers and our practice should be made conformable.

What I contend for is, that the law should go a step further, and render it penal to have a privy so destitute of arrangement that the excrement should be uncovered, spreading itself upon, and being washed into, the surrounding soil, and throwing off every moment pestilential, fever-breeding emanations. It should be within the statute to enforce the confinement of the offensive matter, and the disinfection or covering of every daily accession to the contents of the privy. Until this is done, the settled, fixed, and well-proven laws of sanitary science in regard to cholera, typhoid fever, and diarrhœa, find no acknowledgment in the statute book of our country.

It must never be forgotten that this is not an arbitrary requirement. It is not the whimsical suggestion of delicacy, refinement, or an over-fastidious taste. It is in the interest of, nay, it is essential to, life and health. If it is right, the converse, in being admittedly wrong, is murderous. Let this simple requirement, the daily covering of the excreta, be added to our sanitary enactments, and the habits of the people, unwilling, perhaps at first, will speedily grow up to it. Let Mr. Powell add a definite provision of this kind to his next essay on behalf of our Public Health Law. Sanitary authorities, now multiplied and settling down to work over every acre of England, will be ready to aid its enforcement; and in the recoil of typhoid fever from its baneful preeminence among our zymotic complaints, a thankful people will believe that the health and vigour of a nation is a fitting and well-considered aim of an enlightened Parliament.—*Public Health.*

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### CAUSES OF LUNG DISEASES.\*

The following summary of his inquiry into the excessive mortality from lung-diseases is given by Dr. Greenhow :—

“This inquiry has demonstrated that an excessive prevalence of pulmonary diseases is associated with a great variety of conditions, some of which must clearly be regarded as exciting causes of these diseases. With respect to others, it has been found impossible to obtain accurate and conclusive evidence that they produce diseases of the lungs, but there are strong grounds for supposing such to be the case. There is also a third class of conditions, on which great stress was laid by medical practitioners, and which may perhaps be regarded as having a tendency to produce these diseases. The conclusions deducible from the inquiry may therefore be arranged under the three following heads :—

“A. Conditions which this inquiry has shown to be direct causes of pulmonary diseases.

“B. Conditions so frequently associated with an excessive pressure of pulmonary diseases, that they may be regarded as at least indirect causes of these diseases.

“C. Conditions which, in all probability, co-operate in producing pulmonary diseases, but respecting the influence of which no conclusive evidence could be obtained.”

“A. 1. Inhaling an atmosphere loaded with mechanical impurities, such as fine dust of metal, stone, clay, or of certain animal

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

and vegetable products ; soot, and particles of flax, cotton or woollen fibre, exemplified in the case of grinders of cutlery needles, and other steel articles ; miners, quarrymen, stonemasons, china-scourers, potters, turners of earthenware, makers of plaster of Paris moulds, hacklers of flax and Mexican fibre ; sorters of wool, alpaca, and mohair ; operatives employed in the manufacture of waste silk, and in the carding rooms of cotton factories ; wool-combers ; workers in bone, ivory, horn, and mother-of-pearl ; and makers of walking-sticks, and wooden handles for cutlery, umbrellas, and parasols.

" 2. Inhaling an atmosphere containing carbonic acid and other gases unfit for respiration, or fumes arising from the combustion of gunpowder, or of charcoal, or other fuel, exemplified in the cases of miners and wool-combers.

" 3. Inhaling an overheated and highly-dried atmosphere, exemplified in the cases of the flat-pressers, and some other workers in potteries.

" B. 1. Habitual exposure to a hot and exceedingly moist atmosphere, exemplified in the cases of slip-makers in potteries and spinners of flax.

" 2. Working in ill-ventilated and over-heated factory-rooms, as in many manufactories of textile fabrics, in some of the decorators' rooms of potteries, in ware houses, and likewise in many establishments where young females are congregated together at work.

" 3. Exposure to vicissitudes of temperature, exemplified in the cases of the operatives in several kinds of factories and workshops.

" 4. A stooping or otherwise constrained posture while at work, exemplified in lace makers, throwers of earthenware, certain classes of weavers, file-cutters, and silk-piercers.

" 5. Working continuously many hours daily at a sedentary occupation, such as that of the glove-makers of Yeovil, decorators of earthenware, and welters and finishers of hosiery.

" 6. Working in ill-ventilated and over-crowded rooms, as in the straw-plat and lace schools of Berkhamstead, Towcester, and Newport Pagnell, the winding rooms of Leek, and the weaving shops of Hinckley and Leicester.

" 7. Residing in dwellings so constructed that the bedrooms are badly ventilated, and the cubical space per head is inadequate to the preservation of health, such as are to be found in Berkhamstead and Saffron Walden.

" C. 1. Bleakness of climate, a cold damp soil, prevalence of fogs.

" 2. Marriages of consanguinity.

" 3. Habitual abuse of alcoholic stimulants.

" 4. Insufficiency of animal food."

Cicero once said, "In nothing does man approach nearer to the gods, than in giving health to men."

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## HOURS OF LABOUR AS REGARDS HEALTH.

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Action is unquestionably one of the essentials of life, and it was the unalterable and almost the first destination of man that he should earn his bread by the sweat of his brow, while anatomy and physiology proclaim that the human frame, with its almost half a thousand muscles and its immense and powerful brain, was formed for activity, both physical and mental, but it does not by any means follow that it is best it should be always employed, daily and hourly in the same unchanging, monotonous course. Change and recreation are perhaps as essential to health and life, or, at least, to long life, as is action. Besides, in modern civilized life, the nearest possible approach to perfection is required in every art, and to attain this, the pursuits and actions of individuals are greatly restricted, and the tendency is to overwork a small portion of the body and under work the remainder, so that a large part of it is not called into that activity for which it is designed. In some vocations the muscular system is employed while the brain remains almost entirely inactive; in others, the brain is occupied and most other parts of the body are at rest; in a large number, the hands almost alone are used; while in not a few, only a portion of the brain is engaged. This state of things is incompatible with perfect health. A little time is required by persons thus engaged for the purpose of counter-acting somewhat the effects of this restricted and limited action, or impaired health in some form is certain, sooner or later, to follow.

Moreover, attention to all the laws of health, individually, requires a certain amount of time. Personal cleanliness demands it. Taking the various meals demands much more than is usually appropriated by the masses to this important process. Health, too, demands a certain degree of happiness, and some change and recreation appear to be indispensable to happiness. Idleness certainly does not beget it, and it is generally believed to be better for mankind to be constantly employed in some way. Probably considerable happiness is experienced at the plough, at the bench, at the anvil, but in the case of those labouring by the day or the hour for their food and their raiment, one can hardly conceive it to be very high in degree or exalted in character; and such as it is, it will be found in a great part to arise through a hope of leisure, of ease, of recreation, some time in the future. And why should not the poorer classes as well as the richer, the artisan as well as the professional man, the labourer as well as the employer, have a little time every day in which to share somewhat in that higher civilization which is steadily and gradually spreading its elegant mantle over almost every country? A little time to have their minds elevated and invigorated by a walk in the fields, or the woods, or the park, among the beauties of nature; time to enjoy the fellowship and society of their fellow creatures in toil; time to attend to their mental and physical culture and health? Who could doubt that they would thereby be rendered more happy, and healthy and useful?

If we add to the time now commonly demanded as a day's work—ten hours—the time absolutely necessary for sleeping and eating and for religious observances, the time for change, recreation or enjoyment, for improving the mind or attending to the health of the body, will be found to be very limited indeed, too limited to be employed in this way with any degree of comfort, satisfaction or profit

It has been estimated, even before so many labour-saving machines were in use, that if every able-bodied man were engaged in some useful and profitable employment, a very much shorter labour period than the present would suffice to

very comfortably, and sufficiently luxuriously, support the entire human family. How then at the present time, it may be asked, is the extra labour disposed of? What becomes of the surplus? Is it dissipated in useless or worse than useless luxuries, wasted, bartered for things not at all necessary for health or happiness? Not all of it; though a large portion is. Much of it accumulates, and constitutes in one form or another the wealth of the opulent.

Continuing to labour somewhat more than present requirements demand, in order to accumulate and have something in excess of immediate wants, may be regarded as a most providential provision for a time of scarcity, but, like almost everything else, it may be carried too far. Immense riches are an encumbrance, and cannot bring happiness or health to individuals or nations. Most favorable probably so far as wealth is concerned, is the condition of that people or nation which possesses a proportionately moderate surplus of it in the keeping of a large number of individuals. It has been ascertained not long ago, it appears, that in England, while wealth has greatly increased, upon the whole, it has fallen into the hands of, comparatively, a few persons, and that the large number who in times past were possessed of moderate means, has greatly decreased. This is not a desirable state of matters, and if permitted to go on, would in time most likely create a reaction, as all extremes do, and the tendency would be toward that condition of society which, above all others, almost naturally gives rise to a desire in certain minds for a Communistic system of levelling.

Greatly owing is the present increase of wealth to the large amount of labour-saving machinery now in use. Almost all the necessaries and luxuries of life, excepting those supplied directly by Nature, are manufactured in whole or in part by machines of one sort or another, driven for the most part by steam. One would suppose that muscle would be at a discount. Surely we, as a people, could get on very well now, get all that we could possibly stand in need of, with much less physical or muscular labour than was formerly required. We could, in short, afford to shorten the hours of labour for the laboring classes.

It is notorious that these very classes, from whose ranks have sprung so many who have invented large numbers of our most valuable labour-saving contrivances, are not much benefitted, comparatively, not so much as they should be, by the large amount of such machinery now in use. The few proprietors and capitalists get wealth more rapidly, while the thousands of daily labourers work as long and as hard every day as they did before such machines were invented. And with many, too, their occupation is more laborious, more incompatible with health; their *life* is considerably shortened instead of their hours of labour. Look, for example, at the agricultural laborer who follows the reaper and thresher, and at certain factory workers.

It is quite probable that a certain number of healthy, happy, and vigorous men could do as much at many sorts of work in eight hours as the same number less healthy and happy and vigorous could do in ten. It has been found that the amount of labour men will perform is affected in a marked degree by causes which one would hardly suppose could produce any perceptible effect. For example, according to Dr. Carpenter, it has been ascertained by actual experiment, that brickmakers who drink beer do not make so many bricks by nearly one-twentieth as those who do not drink it. It has also been found that if the quantity of fresh air introduced into a mine by the ventilating apparatus be considerably reduced, there is soon a decided diminution in the amount of work performed by the men. There would therefore probably be but little if any loss to the employer through shorter labour hours.

It may be urged by some, that a large proportion of employees of all sorts would not avail themselves of an hour or two daily, if it were given to them, to attend to their health and to mental and physical development, to seek happiness in legitimate ways, but that they would spend the time unprofitably, perhaps in the tap-room, or in some manner incompatible with their own welfare or the public good. It might not be a safe experiment to give suddenly to all labourers, uneducated and educated alike, to spend as they might see fit, a fifth part

of the time now recognized as the period of their daily service, without first teaching them its value, at least, and how they might best dispose of it. We would not place in the hands of a fellow creature an instrument with the nature of which he had until then been entirely unacquainted, and by means of which, if properly employed, he might be greatly benefitted, but which, if not rightly managed, might prove very injurious, without first teaching him the way he should use it. And then, it should be no reason why all should be obliged to suffer, if a few would, notwithstanding example and teaching, pursue their own evil course.

We believe that time is not very far in the future when eight hours will be regarded as a sufficient length of time in which to do a day's work. Happily, there appears to be a tendency on the part of employers, especially in cities, to give a little more time for recreation to those in their service, as shown in "early-closing" movements and occasional half-holidays. And this tendency will become stronger and develop into a universal established custom as employers learn, as they gradually will, that shorter labor hours will be for the mutual benefit of themselves and those in their employment.

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## SEX IN EDUCATION.

Few subjects affecting the well being of the masses are of greater importance, from a hygienic point of view, than the proper adaptation of education to sex. Few subjects perhaps are attracting more attention, at the present time, than the co-education of the sexes. It is greatly to be feared there is a strong tendency on the part of many to make women the competitors instead of the companions of men, while losing sight of the difference in functional organization, and of the great physical laws upon which happiness, health, life, and perpetuity depend.

We will not here discuss the question, whether it is better, more in accordance with nature, for women to study and



practice the professions, share equally with men in all the strife and competition of business, take part in political matters, and compete with men in the race of life; or to bear children, rear up a family, and act the part of ministering angels in robbing sickness of half its pain by their soothing influence; whether it is better they should take care of themselves, row their own boat, rely upon their own strength and efforts in the battle of life, or be the mothers, the companions, the helpmeets, and the solace of men. It is a highly important question, affecting our entire domestic and social system. If the former is their proper sphere, co-education may the better fit them, if the latter, it will not.

If it were possible to complete the education of boys and girls before the age of thirteen or fourteen, or before that period at which nature develops the peculiarities of each sex, there could not probably be any weighty arguments brought forward against co-education, from a sanitary standpoint; but this is not possible; the brain of either at this age is not sufficiently developed to receive a high education. After the age of thirteen, or in the case of some, of fourteen, the influence upon the sexual system, and through it upon the *constitution generally, of the constant and inordinate excitement to which co-education naturally gives rise, is physically injurious,—prejudicial to the health of both boys and girls, especially of the latter.* Furthermore, co-education tends strongly to give rise to a too early or premature consciousness of sex and emotional development. After the above age, too, the brain of the female must not be crowded, but on the other hand, especially at certain periods, it should have almost absolute rest, or proper and complete sexual development will be seriously interfered with, and actual disease will be likely to follow; and the fresh, blooming, and promising girl will be blighted at the very threshold of womanhood.

As a question of physical endurance, it is probable that girls are equal to boys. It is probable that the former may bear a certain amount of pushing and attain to the rank, intellectually, of the latter. Women, it is true, have a smaller brain by several ounces than men, but it may be of a higher

organization. It is well known that the *quality* of the brain and its degree of organization are to be taken into consideration, and are of great value, in estimating intellectual ability. A large brain may be of inferior organization and the mental power of its possessor below the average; while a small brain may be very highly organized and show more than average ability. It is not, then, that she is positively inferior in mental capacity or in physical endurance, but she is differently constituted, destined for a different sphere. And education should certainly be based upon physical organization and sphere of life; any other basis is false and unnatural.

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### SCHOOL-HOUSE VENTILATION.

The ventilation of school-houses, the places where our youths congregate and spend so large a portion of their time, at a most susceptible period of their life, when it is so essential that every circumstance should favor the highest physical and mental development, should certainly receive the most serious consideration of every one who feels at all interested in the next generation of men and women. Few subjects affecting the public health are of greater importance than this. We need not here descant upon the ill effects on the physical organization of breathing foul or expired air. Every one is familiar with histories of them. Suffice it to say, with the philosophic Hufeland, that "the breath of man is deadly for his fellow-creatures." And that children of average school age throw out each, by respiration, about three gallons per hour of poisonous gas, animal impurities, and watery vapor; and that in every 1000 gallons of these deleterious substances are 3 gallons of dead, decomposing animal matter.

But breathing respired air readily and directly affects the mind. No organ perhaps is so susceptible as the brain of the evil effects of imperfectly aerated blood. "Its immediate effect is to cloud the mind and depress its energy; sharpness of attention, clearness of apprehension, and readiness of memory are all impaired. The spirit, temper, disposition, the

correctness of the judgment, and brilliancy of the imagination depend directly upon pure air."

Using the brain in a vitiated atmosphere is somewhat like working with a blunted instrument. The listlessness and stupidity of children confined in a school-room are frequently due to the foul air they breathe. The purity of the air in a school-room may be tolerably accurately measured by the amount of cheerfulness, activity, and lively interest manifested by the children. We not unfrequently hear of children having been taken from school, because, as the parents say, they were not able to bear studying; whereas, in most cases, they were simply unable to bear the ill-effects of breathing a vitiated atmosphere.

It does not suffice to depend for pure air upon the opening of doors and windows. Even in warm weather this mode of ventilating is often objectionable, admitting, as it does, dust and insects, as well as a warmer air than might be introduced by properly arranged air-flues. In cold weather, window and door ventilation is unsafe, and should not be relied upon. Ventilation, moreover, should, as far as possible, be automatic, and connected with the warming apparatus.

According to Drs. Parkes, De Chaumont, and Wilson, than whom there are no better authorities, in order that the air in any apartment shall be kept sufficiently pure, every adult should be supplied with not less than 3,000 cubic feet of fresh, pure air per hour, in all cases wherein the diffusion of the contained air is uniform. Hospital wards receiving from 3,500 to 3,700 cubic feet per patient per hour have been found not to be free from offensive smell; but the diseased require a larger supply than the healthy. According to the same authorities, the cubic space required in order that the motion of 3,000 cubic feet of air passing through it per hour shall not give rise to perceptible draughts, is at least 1,000 cubic feet. If the cubic space per head is small, the renewal of air must necessarily be more frequent. Growing, studying school children require almost as much cubic space and fresh air as adults. Where in Canada is there is a school-house so constructed as to be capable of admitting of the fulfilment of

anything approximating these requirements? Truly the field for sanitary labour and legislation is large. May it soon be cultivated more vigorously and efficaciously.

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## PROHIBITION FROM A SANITARY STAND POINT.

The public has been told so often and on the best of authority that both physiology and experience prove that the habitual use of alcoholic spirits are the reverse of beneficial; that alcohol in any form cannot contribute to the nutrition of the tissues, and that there are other and better supporters of combustion for the supply of animal heat; that although temporary augmentation of power may result from its occasional use, prolonged bodily or mental exertion can be best sustained without it; that, in short, except as a medicine, it is worse than useless; so often has the public been told this, that the story has become so worn and common-place, it will hardly bear repetition. A quarter of a century ago, upwards of two thousand medical men, in all grades and degrees,—from the Court physicians and leading metropolitan surgeons, conversant with the wants of the higher classes of society, to the country practitioner, familiar with the requirements of the artizan and the laborer,—signed the following certificates, which was published:—

“We the undersigned are of opinion—1st. that a very large proportion of human misery, including poverty, disease, and crime, is induced by the use of alcoholic or fermented liquors as a beverage. 2nd. That the most perfect health is compatible with total abstinence from all such intoxicating beverages, whether in the form of ardent spirits, or as wine, beer, ale, porter, cider, &c., &c. 3rd. That persons accustomed to such drinks may, with perfect safety, discontinue them entirely, either at once or gradually after a short time. 4th. That total and universal abstinence from alcoholic beverages of all sorts would greatly contribute to the health, the prosperity, the morality, and the happiness of the human race.”

Prolonged, vigorous, and constant have been the efforts of various societies in the cause of "Temperance," against the use of alcoholic beverages; and yet, notwithstanding all, the use of them appears to be from year to year on the increase. What remedy then have we for this? As a cause of disease and death, of poverty and crime, collectively, the use—we need hardly say the abuse—of such beverages stands paramount; but as a cause of disease and death alone it ranks high, as every one knows, and we need not here enlarge upon this point; and as a cause of disease and death alone we have here to deal with it. There appears to be no other remedy for this waste of life, short of "prohibition." Hitherto we have been rather opposed to the principle of prohibition, but viewing the "liquor" question from a sanitary stand point, it assumes a somewhat different aspect, and as a sanitarian, we are bound to advocate any measure that will tend to prevent the use of alcohol in every form except as a medicinal agent. No sanitary law can be complete that does not include stringent measures for preventing the habitual and general use of all alcoholic liquors, but more especially of ardent spirits.

The use of distilled or ardent spirits,—brandy, whisky rum and gin, is undoubtedly much more detrimental to the constitution than that of wine or malt liquors, and in conclusion it may be suggested that, possibly, it might be better in adopting any prohibitory bill to include the former only, and test the working of it for a time. A measure of this nature would meet with much less opposition probably than one proposing to interdict the sale of all alcoholic beverages.

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### FACTS AND FIGURES.

One cubic foot of ordinary atmospheric air, of average purity, contains less than one cubic inch of carbonic acid. One cubic foot of expired air contains over 70 cubic inches of carbonic acid.

The average amount of carbonic acid exhaled from the lungs of an adult, under ordinary circumstance, in 24 hours, is

about 16 cubic feet; in which are about  $7\frac{1}{2}$  ounces of solid carbon.

The combustion of 1 cubic foot of coal gas gives rise to 2 cubic feet of carbonic acid; while it consumes the oxygen of 10 cubic feet of air. The combustion of 1 pound of oil produces about 21 cubic feet of carbonic acid; while it consumes the oxygen of 130 cubic feet of air.

It has been found that the breathing of air in which the carbonic acid exceeds 1.5 per 1000 volumes, or .15 per cent., produces in many persons dullness, headache and dizziness. Dr. Smith, a high authority, found that 3 per cent. of carbonic acid in the air "produced great feebleness of the circulation, slowness of the heart's action, and quickened respiration;" which, in the feeble, might prove fatal to life: 5 or 6 per cent. of it is positively dangerous to breathe.

Now a man will, in a space of time little exceeding  $2\frac{1}{4}$  hours, exhale 1.5 cubic foot of carbonic acid; and if occupying a room with a cubic space of 1000 feet, the air of the room will at the end of that time, if unchanged, contain .15 per cent. of the gas, or 1.5 per 1000 volumes. But it is not a very unusual thing for two men to sleep in a room with a space of only half-a-thousand cubic feet—perhaps 7 feet by 9, and 8 feet high,—so that in about 35 minutes the air in the room, if unchanged, would contain .15 per cent. of carbonic acid.

The above physiological facts and figures render obvious enough the importance of thorough ventilation.

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**POISONOUS PAPER.**—A quantitative analysis has been made of sixteen square inches of the green wrapping paper commonly used to wrap about lozengers and candies, sold in shops and railway cars. The result of the analysis showed that this quantity contained 2.34 grains of metallic arsenic, a quantity sufficient to destroy the life of an adult person. Great caution should be observed in purchasing sweet meats for children; little ones not unfrequently put the wrappers in their mouth and chew or suck them. Instances of poisoning may have occurred from this cause, and the source of the mischief never suspected. The coloring matter, too, used in the preparation of confectionery is frequently of a poisonous nature.

VACCINATION.—An Act has quite recently been passed in New York to secure effective vaccination in the City of New York, and the collection of pure vaccine lymph or virus. By virtue of it the Board of Health is empowered to organize a corps of vaccinators within and subject to the control of the Bureau of Sanitary Inspection, to appoint the necessary officers, keep suitable records, and collect and preserve pure vaccine lymph. "This Act," says the editor of the *Sanitarian* "affords the Board of Health an excellent opportunity of applying the most effective means of preventive medicine hitherto known to the medical profession, and thereby opens an avenue by which all may escape the fearful ravages of a loathsome disease, a disease which although alike dreaded by the rich and the poor, is at the same time the most easily controlled of all affections which depend upon contagious elements for their propagation." House to house vaccination is to be inaugurated.

We trust soon to see more stringent measures adopted and promptly and efficiently carried out in our Canadian cities and towns, for the "stamping out" of this most loathsome disease.

PREPARATORY MEDICINES.—An almost bewildering amount of compound preparatory medicine, designed to be used by physicians, are flooding the medicinal market, and, we firmly believe, to the disadvantage of the public and the profession. Manufacturers would not prepare and offer them, however, if physicians did not use or prescribe them. Says Dr. Hay, editor *Chicago Medical Journal*, "the prescription of proprietary medicines by physicians involves not only a breach of professional confidence toward the patient, who has a legal and moral right to expect from his physician the use of his own best skill and judgment, both in the diagnosis of his malady and in the application of remedies for their relief; but it involves also a total abandonment of the whole field of therapeutics to the manufacturing druggist, who is, in all probability, totally ignorant of its first principles." The manufacturers and vendors are hardly blameable Who is?

**SANITARY ASSOCIATIONS.**—A Sanitary Association has been established in Montreal, and the results, it appears, have been very satisfactory. We should be glad to see a like association formed in Toronto, and also in other cities; they would scarcely fail to be productive of much good.

**DRUNKENNESS AND INSANITY.**—The last English census report says that it has been established by the observation of many authorities that intemperance is the most prolific cause of insanity, especially among the working classes. To the cases of madness resulting from habits of drunkenness on the part of the individuals themselves must be added the numerous instances of it in which persons owe their insanity to the intemperate habits of their parents.

**THEORY OF CONTAGION.**—Professor Arnold, of Baltimore, in a paper read before the Medical and Chirurgical Faculty, of Maryland, in April, 1874, on the Theory of Contagion, favours the ideas set forth by Beal, Murchison, and Simon, that contagion consists in living particles. After adducing the results of certain experiments with vaccine lymph, he sums up the following propositions:—

“1st. That infectious matter essentially consists of separate particles. 2d. That these particles are not portions of protoplasm. 3d. That they have a vital in contradistinction from a chemical action. 4th. That some of them manifest the phenomena of germination and development. 5th. That the special differences of these particles may be inferred from the special differences of contagious diseases.”

**STARCHY FOODS NOT SUITABLE FOR INFANTS.**—Starch is not digested readily by infants. Experiments prove that during the first few months of infantile life starchy foods pass through the bowels almost without change, and are excreted with the fœces, giving rise in their passage through the alimentary canal to restlessness, flatulency, and colic. It is well known that saliva, the fluid secreted by the glands in the vicinity of the mouth during mastication, is very efficient in the digestion or solution of starch, first converting it into sugar. And the indigestion of starch in the case of infants is



owing to the scanty secretion of saliva. As soon as saliva commences to be plentifully produced, the difficulty in digesting starchy food becomes much less marked. Corn-starch, arrow-root, sago, tapioca, and such-like substances are nearly pure starch, and hence are not suitable as food for young infants. Diluted cows milk, or even food prepared with biscuits made of good wheaten flour, are much better articles of diet for these little ones.

CARRYING EXPERIMENT TOO FAR.—Dr. Bartholow, of Cincinnati, reported a series of experiments made on a female subject whose brain was exposed to view. The results were interesting, but the character of the performances has excited a very general expression of dissatisfaction and even abhorrence, both in America and Great Britain. At the late meeting of the American Medical Association, Dr. Wilson, of Michigan, offered the following preamble and resolution:—

WHEREAS, Dr. Bartholow, of Cincinnati, O., in his zeal for scientific research, has recently made a series of experiments with electricity upon the brain of a patient, by inserting needles into the substance thereof, and passing currents from these to different parts of the body, causing thereby pain, convulsions, and probably hastening death, and,

WHEREAS, We are ever ready and willing to accord the greatest praise and honor to the original investigator in any part of the domain of medicine, yet these experiments are so in conflict with the spirit of the profession, and opposed to our feelings of humanity, that we cannot allow them to pass unnoticed.

*Resolved*, That in our opinion, no member of the medical profession is justified in experimenting upon his patient, except for the purpose and with the hope of saving said patient's life, or the life of a child *in utero*.