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THE DRINKING-WATER THEORY OF THE PROPOGATION OF CHOLERA—DR MAX VON PETTENHOFER'S VIEWS.*

The drinking-water theory played a great part in the causation of epidemics in the middle ages; it was believed that wicked men, either Jews or Christians, had poisoned the springs from which death was drunk. For good health pure water is as necessary as pure air, good food, comfortable quarters, and so forth. I myself am an enthusiast in the matter of drinking-water, but not from fear of cholera or typhoid fever, but simply from a pure love for the good. For the water is not only a necessary article of food, but a real pleasure, which I prefer, and believe to be more healthful than good wine or good beer. When water fails, man may suffer not only from cholera, but from all possible diseases. In places where cholera prevails the water may always be indicted, for the water-supply is always a part of the locality, and the doctrine will frequently hold good, because the part may be mistaken for the whole. Where the influence of the water is held up to the exclusion of all other local factors error is liable to creep in. In England, where the drinking-water theory is fully believed in, two like influences, in which every other local factor was excluded, were observed in the cholera epidemic of 1854. In one case, in a street in London which was supplied by two water companies, the Lambeth with pure water, and the Vauxhall with impure water, it was found that the cholera was practically limited to the houses supplied by the Vauxhall Company. I was so much impressed by this fact that I endeavored to see whether the epidemic in 1854 in Munich could not be explained on a similar hypothesis. But my researches led me to a negative result. Without doubting the facts observed in London, I am of opinion that the impure water of the Vauxhall Company did not spread the germs of cholera, for the propagation of cholera was not effected by this means in Munich, but that the water increased either the personal predisposition to cholera, or perhaps the local predisposition, since the water would be employed in the houses, and about the soil. Later on, in 1866, Letheby doubted the accuracy of the drinking-water theory, and proved that there had been considerable confusion; so that a house which was registered on the Lambeth Company, really drew its water-supply from the main of the Vauxhall Company, and *vice versa*. The cholera epidemic of 1866 was essentially limited to East London. The East London Water Company supplied this district with water filtered from the river Lea. Lethéby brought forward a series of facts to prove that we might with equal justice accuse the East London Gas Company, since the first case of cholera broke out at the gas factory. A second instance in London was that with which the name of Dr. Snow is associated. Golden Square, a part of London with very deficient drainage, was the scene of a severe epidemic of cholera in 1854. The epidemic concentrated itself in Broad Street. There must have been some reason for this, and the reason must be discovered. Where Golden Square and Broad Street stood was farmerly a place of burial for individuals dead of the plague. This pest-blast of a former century could walk from its grave in A. D. 1854 like the ghost in "Hamlet." but a narrower inspection proved that the old pest-field and the new cholera-field were not exactly co-extensive. Now, however, another fact was brought to light, which led to the substitution of the drinking-water as the cause. In the middle of Broad street there stood a pump of which the water was much esteemed on account of its fresh-

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ness. At the end of August, while the cholera was raging, it was found out that many sufferers had drunk of the pump water, but the fact was not sufficiently decisive, and so a pathological experiment was required. In Broad street there was a percussion-cap factory belonging to Mr. Eley. The persons of this establishment suffered from cholera, and many of them died. Mr. Eley remained well, but he did not live at the factory, though he went there daily and returned home to Hampstead after business, and there lived with his mother and a niece. His mother, who formerly lived in Broad street, had a great liking for the water of the pump-well, which was shown in the fact that her son daily took home the water for his mother and niece. In Hampstead there had been no case of cholera until the mother and daughter fell ill and died of cholera, without having any other communication with Broad street than through the means mentioned. What more is wanted? Who can doubt any longer? An experiment on two human beings with a disease which animals are not susceptible to! A sad privilege. Never before had facts received a more frivolous interpretation. Suppose, for a moment, that Mr. Eley had gone to and from Hampstead to Broad street without having taken the water to his mother and niece; and, further, that they had become ill of the cholera without having drunk the pump-water, would it have been imagined that the cholera had been carried by the son, who remained in good health? The contagionists would probably reply that Mr. Eley may have had the cholera in a mild form. The localists would say that a poison locally originated might be passed on by healthy people without giving signs of illness in them. In 1854, for example, a young lawyer went from Munich to Darmstadt, where his father resided. Up to that time the father had never lived out of Darmstadt, and Darmstadt was as free from cholera as Hampstead, and the distance from Munich was much greater than Hampstead from Broad street. The lawyer was as well in health as Mr. Eley had been, but the lawyer's father fell ill and died of cholera. There was no other factor in the case than the return of the son from Munich. Darmstadt enjoyed an immunity from cholera as great as that of Lyons, Versailles, Stuttgart, and many other large cities. In 1854 a workman went home from the exhibition of Munich to Darmstadt, where he fell ill and died of cholera without the disease being spread to any other house, and no means for disinfection or isolation had been adopted. In 1866 Prussian troops were quartered in Darmstadt and brought the cholera with them. About thirty of the soldiers became ill with cholera, and many of them succumbed; again, none of the inhabitants of Darmstadt had the disease. It must be admitted that Mrs. Eley might have been infected through the inter-communication of her son, just as the lawyer's father had been, without the intervention of drinking-water. The argument in favor of the drinking-water theory rests on the fact that the cholera ceased when the supply of water was cut off, and yet the epidemics came to an end. Again, in Broad street the pump-handle was not taken off till September 8th. Now, an examination of the facts will show that the cholera was already subsiding. In Broad street, on August 31st, there were thirty-one cases of cholera; on September 1st, one hundred and thirty-one cases; on the 2nd, one hundred and twenty-five; on the 3rd, fifty-eight; on the 4th, fifty-two; on the fifth, twenty-six; on the6th, twenty-eight; on the 7th, twenty-two; and on the 8th, fourteen. Just as occurs in India and elsewhere, a violent epidemic generally subsides rapidly.

The further one investigates the drinking-water theory the more and more improbable does it appear. Robert Koch, too, the famous bacteriologist, has hitherto failed to substantiate the drinking-water theory, and I feel convinced that the time is not far distant when he will own that he has gone in the wrong direction. Koch has succeeded in finding the comma bacillus in a water-tank in a region where cholera was prevalent. I have the greatest respect for this important discovery, not as a solution of the cholera question, but only as a very promising field for pathological, not epidemiological, inquiry. It must be remembered that cholera was already prevalent in the neighborhood of the water-tank from which Koch obtained the bacillus. Now, this tank was used not only for drinking purposes, but also for bathing the person and washing clothes, as Koch himself admits. According to my view the comma bacillus must have been present in the water. It had not been shown, however, that the bacillus was in the water before the outbreak of the cholera. Koch is of the opinion that all the bacilli in the water-tank

could not have come from the washing of clothes of cholera-patients, but must have partly been derived from multiplication, yet he forgets that, as he himself has shown, the meat-broth in which the bacilli grow must not be too dilute. It would have been interesting if Koch had estimated the strength of the nutritive material in the water-tank. But what chiefly contradicts the doctrines of the contagionists is the simultaneous disappearance of the cholera on land and the cholera bacillus on the water tank. If it were really true that every case of cholera, the first as well as the last in the epidemic, had the same infective material in its intestinal discharge, and that the epidemic only ceased because the susceptibility of man had passed away, then the bacillus would continue to exist in the tank, always supposing that there was sufficient pabulum for it. And thus it is most probable that the bacillus gets into the tank from man, and not *vice versa*. While Koch was in Calcutta the English physicians there imbued him with their views on cholera and drinking-water. The English had been brought up on the drinking-water theory of typhoid fever and cholera, and could only lay it aside with difficulty. But a few of those English physicians who had studied wide-spread epidemics had renounced their original ideas. Dr. Bryden (the chief of the Statistical Department), Dr. J. M. Cunningham (the sanitary commissioner), Dr. John Macpherson (the Inspector-General of the Bengal Army), Dr. Lewis, and Dr. Douglas Cunningham were all disbelievers in the drinking-water theory. Koch was further strengthened in his views, in opposition to the few Englishmen just named, from the fact that after Fort William in Calcutta was supplied with pure water no more cases of cholera occurred there, although it had been formerly ravaged by the disease. The gentlemen in Calcutta had not, however, told Kock the whole truth. For it was a fact that cholera had begun to decrease in Fort William since 1863, and yet the fresh water supply was introduced as late as March 25, 1873. Moreover, it was not true that the only improvement then effected was a change in the water supply, for many other changes were carried out, the fortress being made a model of cleanliness. Alterations in the drainage of the soil were effected in and around the foundations of the building, which before this was nothing more than a morass during the rainy season; so that, inasmuch as the nature of the soil, as well as the drinking water, was changed, the case of Fort William affords an argument as much in favor of the localists as it does for the contagionists. I may here call to mind an episode which was much commented on at the time, and which is perhaps of the nature of an experiment. Macnamara writes, in his work on cholera: "In connection with this position I may narrate a case which happened in another part of the country, but for which the facts can be vouched. Some dejecta from a case of cholera found their way into a jug of drinking-water, and the mixture was exposed the heat of the sun for the day. Early the next morning a small quantity of this water was drunk by nineteen individuals. Nothing was noticed, either in the appearance or taste of the water, by those who had partaken of it. All remained well during the first day. On the following morning one man was seized with cholera as he awoke; the others remained well till the second day had passed, when two more cases of cholera occurred, and the day after that two other cases were observed. The rest of the party remained well till sunset of the third day, when again two were seized with illness. These were the last cases, and the other fourteen persons continued to enjoy immunity from diarrhœa, cholera, or any disturbance of health." This case is, etiologically, not worth much. Where was the original case from which the infection was supposed to have come? Was it not possible for the nineteen persons to have been brought under the same circumstances as those under which the original case had become affected? Were the nineteen in a place which was as a rule free from cholera, and could they only be affected through the drinking-water? Several cases in India are known to me where guests at a banquet having drunk no water were yet the victims of cholera. For instance, at a baptismal feast which a sergeant gave, a gallon and a half (six litres and three-quarters) of rum was supplied. Twelve persons, including the man and his wife, sat down to the banquet, and on the following evening the whole of the group, except the baby, which still lives in Calcutta, were in their graves. At this feat there was no question of a mixture of anything with the stools of cholera.

When I ask myself how it is that men usually astute can place such implicit reliance on the drinking-water theory, which entails

such ambiguity and contradiction, I can only think of two reasons. Partly, no doubt, there exists the belief that on general hygienic grounds no stone should be left unturned in order to procure a good supply of water where it had previously been bad, and thus the fear of death and the devil proves stronger than the love of truth and God. Again, the drinking-water doctrine appears to many to be the lesser evil as compared with the threatening local and periodical predisposition, which implies a more mysterious and less definable conception. They imagine that the (to them) uncomfortable facts of time and place may be explained on the drinking-water doctrine. The places where the cholera excreta can contaminate the drinking water have a local disposition, and the times at which even cholera prevails, and excreta may contaminate springs and water-courses have to do with periodical dispositions, and thus they escape from explaining the subtle influences of soil and ground water. But any one who thoroughly investigates the local and periodical factors in epidemics of cholera must reject such an explanation. A study of the tables previously given from Brauser places great obstacles in the way of accepting these doctrines. The constant periodicity of cholera in Calcutta or Madras can not thus be cleared up. In the same way it is impossible to understand on this doctrine how it is that the hot, dry season, which must be destructive to the bacilli, is the period during which cholera is most prevalent, and how it is that the hot and wet seasor, which is favorable to the growth of bacilli, cholera is at its lowest ebb. That cholera and typhoid fever are more flourishing when the ground-water is sinking than when it is rising has been explained by the drinking-water theorists on the view that when the ground-water is falling it becomes more concentrated, thicker, and therefore more dangerous. Now, the prolonged researches of Wagner, Aubry, and Port have proved the direct opposite. When the ground water is low it is always purer than when high. Dr. Port has studied for a number of years the state of the water in the garrisons of Munich, with a view of watching its relations with the movement of typhoid fever, and he has found that when the water began to be impure then a falling off in the disease might be predicted. Why this should be so has received an experimental explanation from Dr. Franz Hoffman. Great and numerous are the objections to the explanation of the local disposition to cholera by means of the drinking-water doctrine. Lyons was until the year 1858 supplied with water from superficial wells. The analyses of the waters from a number of the wells prior to the introduction of a better supply would astonish any one. The contagionists get out of their difficulties by merely asserting that though it is always the water which transmits cholera, yet there are a thousand ways in which this may be accomplished. But we have already shown that severe epidemics may occur without drinking-water being implicated, and consequently it is questionable whether, in those epidemics where the water may have been a factor, other causes did not play a more important part in the development of the malady. It is for the contagionists to prove why the infection by drinking-water can only be verified in some cases. The most popular argument of the contagionists is the proposition that cholera spreads by human intercourse, a fact which I unhesitatingly accept. But the interpretation which the contagionists put upon the fact is nullified by the fact itself, as is shown by a closer study of all the influences of intercommunication, whether by land or sea.

HIGH AUTHORITIES ON THE PREVENTION OF CHOLERA.

At the Parkes Museum, London, in one of a series of popular lectures dealing with precautions against cholera, in December last, Mr. Ernest Hart declared that European quarantine by sea, and land quarantine in any case, had invariably proved not only useless in preventing the extension of disease and loss of life, but cruel and mischievous, and had greatly added to the misery and suffering due to outbreaks of cholera. He condemned the attempts at quarantine practiced in France, Italy and Spain as being contrary to the experience and the knowledge of facts, as well as to science. Quarantine, he maintained, had never kept cholera out of any European country, nor limited it to any European district. The prevalence of typhoid fever was, he once more declared, the true index of the liability to Asiatic cholera. Wherever typhoid prevailed, there the local conditions existed which would favour the propagation of cholera; and, until typhoid fever disappeared from among us, we could not consider ourselves free from the risk of the importation and the propagation

of this epidemic disease. The lessons he desired to urge were:—1. That quarantine was useless, because impossible in any complete form; 2. That medical inspection of ports was essential, and with this should go means of isolation, compulsory notification of infectious disease, and the active exertions of all local authorities to free the districts under their control from the known conditions which render them liable to the extension of epidemic diseases when imported; 3. That disinfection was of most doubtful value under the known conditions of choleraic disease; 4. That cleanliness, in its fullest and widest sense, was the prime element of safety; 5. That the prevalence of typhoid fever was the index of the liability to cholera; the diseases were twins in origin and propagation. The president, Director-General Crawford, in moving a vote of thanks to the lecturer, said that, from his Indian experience, he entirely endorsed his remarks as to the uselessness of quarantine for the prevention of the spread of cholera.

James Christie, A.M., M.D., Medical Health Officer, Glasgow, Scotland, and president of the Sanitary and Social Economy section of the Glasgow Philosophical Society, in a paper read before the society, Jan. 21st, 1885, concluded as follows:—

In view of the possibility of an outbreak of cholera in this country, I may enumerate the following as national and local precautions against the disease which might be enforced:—

I. Means for preventing its introduction.

1. The medical inspection of ports, and of the crews and passengers coming from infected ports, should be rigidly attended to. In former times, and even now, in some quarters, quarantine was regarded as the great panacea; but quarantine measures have never been successful in keeping cholera out of a country; and quarantine, in the present advanced state of civilization, is quite impossible.

2. Another national precaution, during the recent epidemic on the Continent, has been the disinfection at railway stations of passengers and goods coming from infected localities. It is a matter of surprise how any national or local authority could ever have sanctioned such measures, as they can be characterised as nothing else but a farce, a medico-scientific carricature.

II. National precautions for preventing its development in the event of introduction.

1. The notification to the local authority of communicable diseases, including cholera, should be rendered compulsory.

2. The isolation to the satisfaction of the local authority of persons suffering communicable diseases, including cholera, should be renderd compulsory.

3. The isolation, to the satisfaction of the local authority, in reception houses, or otherwise, of persons presumably in the stage of incubation from communicable disease, including cholera, should be rendered compulsory.

4. Additional powers should be given to local authorities as to the disposal of excrementitious matters, and as to securing the purity of the water supply in their respective districts.

5. Compulsion should be placed on the local authorities for carrying out efficiently all such measures.

III. Local precautions. These precautions may be summed up briefly as follows:—Cleanliness, in its fullest and widest sense, is the primary element of safety.

In 1871 Mr. Simon, of the local Government Board (Great Britain), in a memorandum entitled "Precautions against the Infection of Cholera," said:—"Happily for mankind, cholera is so little contagious, in the sense in which small-pox and scarlatina are commonly called contagious, that, if reasonable care be taken when it is present, there is scarcely any risk that the disease will spread to persons who nurse and otherwise closely attend upon the sick. But cholera has a certain peculiar infectiveness of its own, which, when *local conditions assist*, can operate with terrible force, and at considerable distances from the sick. It is characteristic of cholera, not only of the disease in its developed and alarming form, but equally of the slightest diarrhœa which the epidemic influence can cause, that all the matters which the patient discharges from his stomach and bowels are infective; and that, if they be left without disinfection after they are discharged, their infectiveness, during some days, gradually grows stronger and stronger. Probably under ordinary circumstances the patient has no power of infecting other persons except by the means of these discharges, nor any power of infecting even by them, except in so far as particles of them are enabled to taint the food, water, or air which people consume. Thus, when a case of cholera is imported into any place, the

disease is not likely to spread, unless in proportion as it finds, locally open to it certain facilities for spreading by *indirect* infection. In order rightly to appreciate what these facilities must be, the following considerations have to be borne in mind :—*first*, that any choleraic discharges cast, without previous thorough disinfection, into any cesspool or drain, or other depository or conduit of filth, infects the excremental matters with which it there mingles ; and probably to some extent the effluvia which these matters evoke ; *secondly*, that the infective power of choleraic discharges attaches to whatever bedding, clothing, towels and like things, have been imbued with them, and renders these things, if not thoroughly disinfected, as capable of spreading the disease in places to which they are sent (for washing or other purposes) as, in like circumstances, the cholera patient himself would be ; *thirdly*, that if, by soakage or leakage from cesspools or drains, or through casting out of slops and wash-water, any taint, however small, of the infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of imparting the disease. When due regard is had to these possibilities of indirect infection there will be no difficulty in understanding that even a single case of cholera, perhaps of the slightest degree, and perhaps quite unsuspected in its neighbourhood, may, *if local circumstances co-operate*, exert a terribly infective power on considerable masses of population."

Mr. Simon further stated that cholera derives all its epidemic destructiveness from filth, and especially from excremental uncleanliness, and that the local conditions of safety are, above all, these two : (1) That by appropriate structural works all the excremental produce of the population shall be so promptly and so thoroughly removed that the inhabited place, in its air and soil, shall be absolutely without fœcal impurities ; and (2) that the water supply of the population shall be derived from such sources, and conveyed in such channels that its contamination by excrement is impossible. These views of Mr. Simon are still universally accepted and quoted.

FROM CHLOROFORM there were reported in England thirteen deaths during 1883 and from ether none. Yet ether was more extensively used than ever before.

INTERESTING ACCOUNT OF CHOLERA IN THE MASAI COUNTRY AND ZANZIBAR.

The experienced health officer of the city of Glasgow, Dr. Christie, in a paper read before the Philosophical Society, in January last, referred to elsewhere, gave the following interesting record in his own experience : A few years ago, while following out one branch of the track of the great cholera epidemic of 1865-70 : viz., that through Central Africa, I ascertained that the disease was conveyed from the Galla Borani country, south of the river Jub, by the fighting men of the Masai tribe, who inhabit an immense area of country to the east of the Victoria Nyanza. At the time I obtained some curious details regarding the mode of life of the Masai people, and I was glad to learn from Mr. Joseph Thompson, who recently travelled through the Masai country, that these accounts were not exaggerated. The Masai are pastoral and nomadic, moving about where pasture for their flocks is to be found. Their tents are constructed of stakes fastened at the top with thongs, covered with bullock hides, and plastered over with cow dung. The community is divided into two classes—viz., the married men and women with their families, and the unmarried men and women. The young women at the age of twelve, and the young men at the age of fourteen, are moved out from the married kraal, and live in an entirely separate kraal. From the time that they enter on this stage of life, until they get married, which is usually many years afterwards, their sole diet is blood, milk, and beef. They partake of no vegetable food whatever, and they drink no water. They are practically go-nakeds, their dress being merely a skin over the shoulder, which they also use as a mat for sleeping on. During the rainy season their sole occupation consists in tending their flocks ; and during the dry season in cattle lifting raids. Their arms consist of a spear with a head something like a shovel, and a large bullock hide shield. They set ont on their raids at the close of the rainy season, and return before the rains set in, as otherwise their hide shields would be softened and rendered useless.

In 1868 cholera swept the Masai country ; but I am unable to state anything as to its relative prevalence among the kraals of the married and the unmarried. It was, how-

ever, introduced into the country by the fighting men, who eat nothing but beef and drink nothing but blood and milk.

Now, what about the etiology of cholera among the Masai? They throw out their dead at some little distance from their kraals, and by the morning nothing is left but bones. Anything approaching the conveniences of modern civilization is unknown, and sewage gas does not exist. Water pollution as a cause of the disease, among the fighting men at least, is out of the question, for they drink no water. The eating of unripe food cannot be regarded as a cause for they have none to eat. It is not at all likely that the cause of disease would be vitiated air drawn into their skin tents by the heat within, or by the pressure of the subsoil water below. The only possible mode of communication would be by inhalation, or through the medium of milk, blood, or beef. The field of enquiry is, therefore, very much narrowed; for we have no overcrowding, no unclean, unhealthy habitations, no prejudicial circumstances affecting one portion of the community more than another. In a case of cholera there would be excremental pollution within the tent, dried excremental matter might adhere to the bullock-hide mats; and blood, milk or beef within the tent would be liable to contamination. Account for it as we may, cholera swept the Masai country.

When the disease reached the island of Zanzibar its ravages were unparalleled in modern history; but two sections of the community escaped entirely—the Europeans living on shore and the Banyans, or Hindoos, natives of India. All other sections of the community were attacked, and many Europeans living on board ship fell victims to the disease. The Banyans are strict vegetarians and they eat no animal food whatever. They eat fruits and bread-stuffs, and they drink water and milk. Their milk, however, is the produce of their own cows, and their water is drawn from their own wells, no other person having access to them. The Europeans living on shore are particular about their water supply, and they use none drawn from the town wells, all being carried a distance of several miles from sources not obviously liable to pollution. Ships lying in harbour have their water supply, when needed, drawn from sources obviously liable to excremental pollution. The Europeans living on shore and the Banyans had nothing in common but a water supply free from excremental pollution, and they escaped the disease. The Europeans living on board ship had everything in common except water supply and the former escaped while the latter were attacked. Indeed, with the exception of the water supply, those living on board had the best of it, as the north-east monsoon was blowing strongly at the time.

FREDERICK CHURCHILL M.D., F.R.C.S., ON HIGH PRESSURE EDUCATION.

Following are some selections from a paper in the *Medical Times*, by Dr. Churchill, Surgeon to the Victoria Hospital for Children, London, England.

It is impossible to ignore the valuable opportunities possessed by medical men on the staffs of our Children's Hospital for studying carefully the ætiology of multiple forms of brain mischief from which the children in our Board Schools have suffered. The evidence already to hand from the pen of physicians attached to London hospitals is weighty, and worthy of careful consideration by philanthropists, teachers, sanitarians, and the governing authorities of our schools. These gentlemen speak of an increase of headache, lassitude, pallor, and sleeplesness, with brain irritability and chorea among their patients during recent years.

I feel it incumbent upon me to enter the arena of conflict backed by an experience of fifteen years' constant study of children's diseases, with an average attendance upon over one hundred Board School children every week at the Victoria Hospital for Children. I must add to the list of positive evils alluded to above some equally pernicious effects of over-pressure, if not quite so directly traceable as cause and effect. I refer especially to the want of systematic inspection of the sanitary arrangements of schoolrooms. Is it not most unreasonable to herd together teachers and children in magnificient palatial buildings erected with every care for sanitary fitness and permanency of structure, and yet to have no officer appointed to see that the excellent hygienic arrangements, provided regardless of cost by the architect, are being brought into daily use for the benefit of the children? In such an ever-varying climate as ours it is impossible to leave sanitary arrangements to work automatically. The class-rooms need to be ventilated and the air changed at regular intervals, and for this purpose arrangements should be made, depend-

ing upon the varying state of the external atmosphere, for efficiently purifying the air inspired by the children. Masters have complained to me of sickness, lassitude, and incapacity for work, in consequence of the tainted atmosphere in which they have to sit with the children daily. I can almost hear the echo of the children's voices as they listlessly sit under the tyranny of such iron-bound codes and casements, breathing out the plaintive lamentation "*Dum spiro spero.*"

I have particularly noticed of late the frequency with which boys from 16 to 20 have come under my care with nervous twitchings of the face, making all kinds of contortions, especially when in society, and such boys I have invariably found are undergoing a course of cramming which thoroughly unhinges the delicate framework of nerve organization.

To force the mind by excessive and prolonged tension during the periods of childhood and youth, as is too often the case under the modern system of high-pressure education, can only be attended with the most pernicious results. A temporary blaze of intellectual energy will astonish and delight the spectators; but such a rapid outburst of brilliancy is almost as rapidly extinguished as soon as the occasion for the display has passed away. Precocious children are, to say the least, a great bore, and even those endowed with highly developed mental powers often turn out the most ordinary commonplace individuals.

I desire to show the necessity of giving more direct attention to the health and growth of the body during the period of adolescence, so that *pari passu* mind and body may each receive by steady and continuous cultivation an accumulation of force and energy to enable the whole being to grapple successfully with the continual strains put upon it by unavoidable competitive examinations . . . .

Locke, in his well known treatise on education, by teaching the importance of reasoning with children at a very early age, has done much harm to the rising generation. Such attempts are very likely to create a predisposition to insanity. By unduly taxing the brain, the organic functions of the body are neglected, the processes of nutrition and secretion are interfered with, and impeded growth is the consequence.

It is said that insanity prevails to a larger extent in England than in any other country, and this is accounted for by some writers on the ground that almost every person has liberty to engage in competition for the highest honors and emoluments. Such liberty does not prevail in despotic countries, hence the decrease in the percentage of insanity. I am not in a position to affirm or deny this statement, and therefore quote it without comment.

Dr. Conolly having conducted considerable researches into the statistics of insanity, found that the disease prevails most amongst those whose minds are excited by hazardous speculations and by works of imagination. Taking the educated classes, he found that priests, painters, sculptors, poets and musicians contribute largely to swell the ranks of the insane, whereas those whose minds are engaged in more practical study, such as physicians, naturalists, chemists, etc., seldom become inmates of asylums . . . .

It is a popular delusion to suppose that the amount of "brains" possessed by a person is proportionate to the size of the brain. "The best goods are generally packed in the smallest parcels." So the finest brains are those which have small convolutions with deep sulci, giving an extended surface of grey matter for the elaboration and development of the reasoning faculty. The grey part consists of an aggregation of multipolar cells, closely connected together by filaments or processes through which the complex machinery of thought generates specific intellectual conceptions. It is generally considered that disintegration and re-formation of cells takes place during the process of thought conception, so that for the performance of the most simple as well as the most occult acts of mental development, growth and decay of cell structure are continually at work.

If this be true, how necessary it must be to foster and train the youth, by steady development and culture of the mind, so that, as the outcome of such training, the object set before him may ever tend in the direction of storing up learning and forethought which will be of the greatest service to him in after life.

We must never forget that some of the greatest philosophers and men of mark in their generation have been those who in their youth received no better education than their associates. Self-education in after life was what really made them great. If a child shows at an early age a great propensity for study, instead of encouraging him to proceed

on this course, as most teachers do, it is necessary to restrain his intellectual ardour. Precocity of mind is often a precursor of disease, which is best cured by checking rather than encouraging its development. Young people are much to be pitied who have parents who are anxiously striving to cultivate their childrens' brains so as to rival their neighbours and associates, to the neglect of all hygienic principles and *regime*. Such children are often closeted for many hours in an unventilated schoolroom, breathing impure air, when they ought to be attending to those organs of the body which during the period of adolescence are in an active stage of development. They need and must have plenty of outdoor exercise to promote healthy growth. Those who are much admired in youth for their genius and talents often waste their energies unchecked by friends who should know better, and on arriving at manhood they are found to possess only ordinary minds.

The basis of all sound education should be organic health, and then instruction will follow in due course, as an ornament, to grace the robust youth with a solid substratum of education.

INCREASE OF CANCER.

On several occasions within the last two or three years reference has been made in this JOURNAL to the increase from year to year in the number of deaths from cancerous disease in Ontario, as shown by the returns of deaths to the department of the Registrar General. According to the last report from this department recently issued, the increase continues. The report reads:—In 1879, 278 deaths were recorded from cancer; in 1883, the mortality reached 403, being an increase of 125 or 44 per cent. in four years. In the SANITARY JOURNAL of March, 1881, it is stated that in 1871 the number from cancer was one in every 85, from all causes; in 1872, one in every 79; in 1873, one in every 89; in 1874, one in 72; in 1876, one in 57; in 1877, one in 58; in 1878, one in 62; and in 1879, one in every 61. In 1883 there was one death from cancer in every 52 from all causes.

H Percy Dunn, F.R.C.S., sends the following article on cancer in England, to the *Pall Mall Budget* (*Pop. Sci. Monthly*):—There is reason for the frequent inquiry which meets the ears of medical men in the present day, Is it not true that cancer is increasing? For however much we may attempt to throw into the shade our convictions upon this matter, the records of the Registrar-General remain to show, in all the obtrusiveness of an unvarnished statement, the annual increasing morcality from this terrible disease. A reference to the forty-third annual report of the Registrar General discloses a somewhat alarming state of things, in connection with which it must be conceded that reflection affords but little assistance in the attempt to solve the cause. According to the report, 80,049 deaths from cancer occurred during the ten years from 1860-'69 inclusive, and the annual average increase was 248. During the years 1870-'79 the total number of deaths from cancer was 111,301, and the annual average increase was 320. As far, therefore, as numbers are capable of showing, we have here conclusive evidence of the increment in the mortality from cancer. It is observable also that the rate of increase is higher in the years 1860-'69 than in the preceding decennium—namely, in the years 1850-59. In short, in the years 1850-'59 the increment was about 2,000; in 1860-'69, 2,400; in 1870-'79, 3,200. We have then confessedly to face the fact that cancer is increasing in our midst at a rate which bids fair to become more and more serious with the advance of time. In an article entitled "An inquiry into the Causes of the Increase of Cancer," published in the *British Medical Journal* a year ago, I drew attention to the observations which had been made upon the subject by the late Charles Moore, whose investigations into the pathology of cancer had brought under his notice the incontrovertible evidence of the increase of the disease. In the year 1865 he published a small book called the "Antecedents of Cancer," the contents of which chiefly consist in an attempt to explain in what manner the augmentation of cancer is influenced by the circumstances of life prevailing in this country. For instance he held that the introduction of corn laws, the discoveries of gold and sanitary improvements, whereby the well-being of the pation was conspicuously established, affected cancer indirectly by bringing into prominence the predisposing causes of its occurrence; and good living, it is thought, which follows as a carrollary of commercial prosperity, is intimately associated with the manifestation of cancer. Again, inasmuch as cancer is characteristic of the healthy, it may be expected to abound

and the conditions of health. The greater prevalence of the disease among the rich than among the poor can probably be explained in this manner. According to a a French observer, the proportion of cancer in the wealthy classes is about 106 in 1,000, in the poor classes it is 72 in 1,000; or at a rate in the former case of ten per cent, and in the latter of seven per cent. Now, curious as it may seem, cancer is met with in the lower animals; and it has been said to prevail more frequently among those which are flesh-eaters than those which are herb-eaters. It has been stated by the late Dr. Crisp, who had good opportunities of judging, that cancer is by no means an uncommon disease among the domesticated animals, while in wild animals and uncivilized man it is rare. In 230 also of the quadrumana which he had examined there were no traces of cancer. Thus the inference to be drawn from these statements appear to be plain. It is almost conclusive that the habits of life, either in man or the lower animals, are concerned in the production, or at least in the predisposition, to cancer. The surroundings, it is conceivable, of an autochthonic existence do not include influences which favor the production of the disease; consequently, in uncivilized man the disease is rare. It is, however, different when man becomes civilized, for then the predisposing, if not exciting, causes come into play, and man has entered an area of life in which the disease has acquired not only a pronounced but an augmenting fatality. And the same is true of animals. Now, as far as we know at present, cancer has not a zymotic origin; in other words, it does not arise from any micro organism or "germ." It is consequently neither infectious nor contagious. Cancer, in short, can neither be "caught" nor "given." It commences *de novo* in each individual whom it attacks. There is, moreover, no such thing as anything cancerous being transmitted from parent to child in the cases in which the disease occurs in one and the other. It is possible to inherit a predisposition to cancer—that is, if cancer appears in a family, the members may be said to possess a liability to the disease, but practically this statement does not convey with it much significance, because, until the disease becomes manifest, no person can be said to be cancerous, inasmuch as he does not inherit the disease, but simply the liability to it. We are confronted with the problem of how to limit the frequency of the disease, and the difficulty of this is apparent in view of the fact that we know almost nothing of its origin. Cancer, as I have said, is not contagious; it stands almost alone as a disease which increases with our prosperity, and, while our health laws are raising the standard of public health, the mortality from cancer stands forth as a blot upon the results, detracting in part at least from the measure of the success that has thus far been obtained. Observation has shown that cancer has a certain geographical distribution. It prevails extensively in some parts of the globe, and is scarcely known in others. For instance, it is met with most largely in the central parts of Europe, but in the extreme north of this continent the inhabitants enjoy an almost complete immunity from cancer. It is stated to be unknown in the Faroe Islands, while in Iceland in one year it proved mortal in only thirty-seven cases out of 50,000 inhabitants, or in a proportion of 0.07 to 1,000. With reference to England in this connection, Englishmen may be regarded as unfortunate; for within the geographical area of these islands cancer asserts largely malignant and fatal influence. It afflicts mankind chiefly at an age at which, by universal consent, life is best enjoyed. Many and various have been the attempts devised to combat the inevitable fatality of its accession. The gleam of light, however, which has shed some radiancy over the gloominess of cancer, comes from surgery. It may be said of the surgery of the present day that better results are obtained from the surgical treatment of cancer than was probably the case in any former age. Some operations are now being practiced which hitherto were not considered justifiable, owing to the want of success which followed their performance. Others have lately been introduced, the practicability of which has proved the wisdom of their conception. Sufferers from cancer who formerly would not have been relieved are, in the present day, benefiting from the application of the principles of scientific surgery. Years of life—some years at least—and the mitigation of much physical and mental suffering, fall to the lot of surgeons to confer. Even the stomach, which in the male after a certain age commonly becomes the seat of cancer, has been dealt with, and a portion of it removed which was diseased, the result being favorable in so far as suffering was relieved and life prolonged.

THE "DESTRUCTOR" OR REFUSE CREMATORY.

The "destructor" for the burning of refuse established in London, E., by Mr. Geo. Shaw, is thus described by the *Sanitary Engineer* of that city: It represents externally a cubical mass of brickwork about thirty-six feet long by twenty-four feet deep and twelve feet high; it consists of ten compartments or cells lined with fire-brick, all well tied and bolted together with strong iron tie-rods, with substantial wall-plates at the ends, and wrought-iron channel and angle irons along the front of the furnaces. The top forms a perfectly flat platform, having five openings about three feet by two feet each in the centre, into which the refuse to be burned is shot or shovelled. About a wagon-load of refuse is sent into the holes or openings referred to each time the furnaces require feeding; it falls upon a sloping hearth, which is covered in by a reverberatory arch of fire-brick, and it slides forward when sufficiently dry toward the fire-bars, where it burns somewhat fiercely, the fire-brick arch above concentrating the radiant heat upon it. The opening for the entry of refuse is divided from the opening for the exit of gases by a wall, a bridge preventing the refuse, which is heaped up immediately below, from finding its way into the main flue. Two cells are provided with special openings about three feet by three feet, immediately over the red fires, for the introduction of infected mattresses or other bulky things, where they are readily consumed without causing a smell. In several towns these openings have been found valuable for destroying condemned meats. At Leeds, during the year ending December, 1883, they consumed 14 carcasses of beef, 15 carcasses of sheep, 160 carcasses of pigs, 8 carcasses of calves, 3 carcasses of goats, 2 carcasses of horses, 1 carcass of donkey, 130 rabbits, 156 dogs, 48 cats, 220 beast heads, 6½ tons of shellfish and shells, besides 33,000 loads of ordinary refuse. The Commissioners, however, have another effectual method of treating their condemned meat, though they may find the openings useful for animals that have died of infectious diseases. The gases from the furnaces on the way to the chimney-shaft pass through a large multitubular boiler of special construction, and arranged with flues so that every partical of heat may be utilized. At intervals, varying according to the refuse that is burned, the clinkers, which are simply a fused mass of glass, earthenware, etc., are withdrawn through the furnace doors, and a further charge of refuge shovelled in at the top. The result of the process is that everything is consumed, or converted either into clinkers or a fine ash. The destructor is estimated to deal with sixty loads in twenty-four hours; but from results already obtained it is expected to exceed this amount when the workmen become better acquainted with their duties. The labor of two men suffices to feed the cells by day, and that of two by night, and a similar number for the withdrawal of the clinkers, etc. As before stated, the hot gases pass through a large multitubular boiler, where they generate steam to drive a horizontal engine with 18-inch cylinder and 3-feet stroke. This engine works three mortar mills with pans eight feet in diameter. Into these the clinkers made in the destructor may be mixed with lime, and ground into mortar. From the same boiler steam is also conducted to two four-horse power engines, fixed at the end of the destructor, which drive powerful gearing automatically arranged to lift the waggons as they enter the yard, and to tip their contents directly on the top of the furnaces. No fuel of any kind is required, the refuse being amply sufficient to generate steam to drive the whole machinery. A small vertical boiler is connected with the small hauling engines in case they are required to lift refuse when starting the works. At the time of the visit there was only one lift in action, but it was evident that the steam power would comfortably lift more than was required, if both were in use. We saw the waggons enter the yards from their rounds of collection in the city. They contained almost every conceivable kind of waste. One waggon made a special delivery of several hundred rotten cocoanuts; but cocoanuts, dead dogs and cats, shellfish, with other offal, had all to undergo the warm operation of cremation, and all this apparently disagreeable work was carried on without the slightest nuisance. We watched the waggons drawn under the lift. When in position chains were quickly attached, and in less time than it takes us to write, the waggon body had gone up and was being emptied on the high level platform; while the horse and wheels were standing on the ground level, the waggon body almost immediately reappeared empty, and was delivered into its position again between the wheels, and then the horse and waggon were

started upon another collecting round. This ingenious contrivance which lifted the waggon appeared to be comfortably worked by one man, so situated that the waggon was from first to last always in his view. The gearing is, however, automatically arranged to stop itself in case the man should neglect his duty. The drawing of the clinkers gave us ample evidence of the heat contained in the cells—molten metal and glass, etc., in one red glowing mass, forming, in some instances, in bulk cinders two feet long by one foot wide. Water is conducted near to hand, by which the clinkers are slacked and taken at once to the grinding or motar mills. These works, from a sanitary, and probably financial point of view, are, beyond doubt, far ahead of similar business works, either in London or elsewhere."

POISONING BY ROTTENNESS WITHIN THE HUMAN BODY.

The civilized world is all astir, says the *Detroit Lancet*, to shut off the causes of human sickness and human death from the decomposition of organic matters outside of the body. Sewer gas, swamp poison, damp dwellings, and a thousand other conditions under which organic decomposition occurs, are sought to be elimitnead, with more or less success.

Of the generation of poisons within the body we know less. But some facts are sufficiently established to show that cases of more or less gravity of poisoning do occur from this source. Senator, in *Berlin Klin. Woch.*, described a case in which the patient became collapsed, and nearly died with all the symptoms of poisoning by sulphuretted poison generated in its own intestines. Dr. Golding Bird has described a group of symptoms, including hypochondriasis, and depression of spirits, produced by an excess of oxalates, as shown by their abundant accumulation in the urine. Poisonous alkaloids have been shown to circulate in the blood. Bocci *(Arch. per le Scienze Med.)* has extracted from the human urine an alkaloid which has exactly the same action as curare. This alkaloid has the same effect as an alkaloid found by Brieger to be formed from fibrin by the action of gastric juice. Both of these alkaloids, like curare act by paralyzing the peripheral terminations of the motor nerves.

Dr. Brunt shows that the bitterness of gall is not from any normal constituent of the gall itself but from the admixture therewith of some alkaloidal substance or substances derived from digestion. It is well known that in some cases an excessive languor comes on a couple of hours after a full meal rich in nitroginous subtances. Dr. Brunt *(British Medical Journal)* regards this as due to poisoning from alkaloids formed by imperfect digestive processes. In these cases there is a curious weight in the legs and arms, the patient describing them as lumps of lead. The symptoms are extremely like those exhibited by curare poisoning.

In some cases sick headache can be prevented by confining the patient to an exclusive non-nitrogenous diet. It is more than probable, Brunton says, that some headaches, as well as langor, are due to poisonous products derived from nitrogenous food. This field of study is just being opened up, and it gives promise of revelations that shall be most helpful to all, in their endeavors to maintain a healthy state of the body and mind.

C. Anton Ewald, in DuBois-Ramond's *Archives*, reported a case in which a gentleman on lighting his cigar, was astonished to find that inflammable gas was issuing from his mouth. Here marsh gas was formed in the intestines and passed through the orifices of the stomach into the mouth.

A PAPIER MACHE FLOOR COVERING.—A new papier mache process for covering floors *(Sci. Am.)* is described as follows: The floor is thoroughly cleaned. The holes and cracks are then filled with paper putty, made by soaking newspaper in a paste made of wheat flour, water and ground alum, as follows: to one pound of flour add three quarts of water and a tablespoonful of ground alum, and mix this thoroughly. The floor is then coated with this paste, and a thickness of Manilla or hardware paper is next put on. If two layers are desired, a second covering of Manila paper is put on. This is allowed to dry thoroughly. The manilla paper is then covered with paste, and a layer of wall-paper of any style or design desired is put on. After allowing this to thoroughly dry it is covered with two or more coats of sizing, made by dissolving one-half pound of white glue in two quarts of hot water. After this is dry, the surface is given one coat of "hard oil finish varnish." This is allowed to dry thoroughly, when the floor is ready for use.

The process is durable and cheap, and, besides taking the place of matting, carpet, oil cloths, etc., a floor thus treated is rendered airtight, and can be washed or scrubbed.

THE CHOLERA GERM.—The cholera bacilli of the Asiatic cholera (after Koch, from *Scientific American*) appear to be something unique, identical, and unlike any other known or described species. It is exceedingly small, and much smaller than any other form of bacilli, being more obtuse and comma shaped, with a single spore in its larger end at the time of maturity. At first, when inhabiting the mucous corpuscle (which is the home of the germ) it is more regularly oval or elliptical, existing in chains or chaplets end to end, as seen in the outer edges of the rounded and oval mucous corpuscles and broken parts of same. Inside the corpuscles they are more broken up, yet usually form short lines or chains. They multiply by transverse division (across the middle) very rapidly, and completely fill the corpuscle, bursting it at last, at which time the bacilli are set free, become motile, and take on the peculiar comma-form appearance. This is also its time of maturity, at which time the spore may be observed in the enlarged end opposite the curved and shortly pointed end. Their size at first, in the corpuscle, is about one twenty-five-thousandth inch long by one fifty-thousandth inch broad, afterward about one-twenty-thousandth by one thirty-thousandth inch, which is bordering on the size of of micrococci. They readily take the aniline staining, and to be seen well require a high-power objective with a magnification of at least fifteen hundred diameters. A slide was prepared by one of Koch's assistants, who placed the cover on the mucous lining membrane of the intestines of a cadaver in Calcutta, and was kindly sent by W. J. Simmons, of that place, to J. M. Adams, of Watertown, N.Y., who gives us (*Sci. Am.*) the figure and substance of the above article.

OPIUM SMOKING.—In New York and Philadelphia (*Med. and Surg. Rep.—Det. Lancet*) there has been a rapid introduction of opium smoking during the past five years. The late Dr. Kane, of opium notoriety, affirmed that in most large cities of the United States opium smoking was common. At that time we made an investigation of Detroit, but we could find no evidence that a single "joint" existed. It is possible that they have been introduced since. There is no reason why the drunkard, the devotees of various forms of narcotic poisoning, should not resort to this one. The "joint" has one recommendation, it provides for the protection of those whom it intoxicates, till they are sober. Unlike the saloonist, when the keeper of a "joint" has made a person incapable of walking, he furnishes him a bed, or bunk, in which he can lie till the effects of opium have passed away. But, like all other kinds of narcotic indulgences opium smoking takes hold on hell—mental hell, moral hell, and physical hell. The career of the Dr. Kane already alluded to is a melancholy instance of the effects of this habit.

RINGWORM INFECTION.—If the hair of a child suffering from ringworm is taken from the affected part and put under a microscope, the hair will be seen to be riddled with the minute round cells of a fungus which arrange themselves in the form of chains. If these little round cells are watched they will be seen to grow and multiply by budding and dividing, and in this way they gradually extend their area of operations. These little fungi have been found floating in the air near an infected patient. The most usual carriers of the disease from child to child is the hat and cap, to which the cells attach themselves.

WOMEN IN SANITARY WORK.—An association of ladies of standing has been organized in New York for the promotion of sanitary work. The Detroit *Lancet* says: Last year Dr. C. F. Chandler was removed from the presidency of the New York City Board of Health. It seems that he insisted on looking out for the sanitary condition of the city. This did not suit the ruling powers. Hence he was given indefinite leave of absence. Among other results which followed, manure dumping grounds were permitted to remain within the city, producing not only discomfort, but sickness and suffering and death. The Board of Health did not remove them. Being appealed to to exert its power in causing their removal, it confessed its inability to do so. At last the ladies took hold of the matter, appealed to the grand jury and had the contractors fined and the manure dump removed. Finally they secured an official censure of the Board of Health. Thus it appears that the New York City Board of Health is under the influence of politics, of the worst sort, viz: money, bribery and intimidation. It is to be hoped that the ladies will not let the matter drop until an honest board is put into power.

COURT ROOMS AND JUDGES.—*The Orillia Packet*, ever alive to sanitary interests, gives the following merited sharp cut at the York county court house: Referring to the fact that Chief Justice Cameron sat nine hours a day, without intermission, during the winter assizes in Toronto, a city paper says the Chief Justice sets an example which might well be followed by other Superior Court Judges. Certainly, if the "other Supreme Court Judges" desire to commit suicide, the method is to be commended, as at once speedy and economical. But if our present judges are to be thus summarilly sacrificed in the vile den which does duty as a court room at Toronto, how are the places to be filled? Men like the Blakes, D'Alton McCarthy, and Christopher Robinson, with an income from their profession of from five to ten times as much as a judge's salary, are not likely to immolate themselves from pure patriotism, and already the Dominion Government has been obliged to use some decidedly poor material to fill up the vacancies caused by death. The Toronto *News*, with the combined force and elegance of diction for which it is distinguished, says the jurymen "kick like steers" because they are not allowed an hour for dinner. Small blame to them. And if the Chief Justice and his brother judges would take their turn at "kicking," and refuse to sit even one hour a day in the pest-hole which the small-souled people of the wealthy county of York consider good enough for a court room, they would be doing something more like justice to themselves, and in the end better service to the country, which can ill spare them.

CHOLERA DEVELOPMENT.—Professor Pettenkofer, of Munich, and his followers hold that the cause of cholera is an actual poison conveyed by human intercourse from place to place; and that persons must come from an infected spot into the new area. It is not necessary that the individual himself should be infected with cholera; but he may bring attached to himself, in a way unknown at present, a poison which is deposited on the soil, gets into the soil, and under favouring circumstances of moisture and temperature becomes finally developed into a poison capable of producing disease in those who are susceptible of it. In order that the disease may be communicated to others, it is necessary that the disease poison should first find entrance to a suitable soil, be developed there and be extended thence by ground water tension.

GENERAL GRANT'S CASE.—Dr. Fordyce Barker, the family physician of Gen. Grant, is reported (*Jour. Am. Med. Assoc.*) to have recently given the following account of his condition: "Gen. Grant's health has improved very much during the past few weeks, and the swelling in his mouth, which a few weeks ago made it difficult for him to talk or eat, has subsided in a great measure. Some eight or ten weeks ago he was suffering from a swelling, accompanied by great pain, in the back of the tongue, and I called in Dr. J. H. Douglas for the purpose of applying local treatment. The General's smoking, in which he had been accustomed to indulge all his life, seemed to irritate the tongue, although he was not conscious of its affecting his general system. We therefore advised him to cut down his smoking to the first half of three cigars a day. He followed this advice for a week, and then gave up smoking entirely, apparently without the least disturbance to his nervous system, or any unpleasant effect whatever. The improvement in his condition since then is marvellous."

DANGER IN THE WATER TROUGH.—The *British Medical Journal (Sci. Am.)* suggests a danger to horses at public drinking troughs. It believes that glanders are spread among horses in this way, and recommends a stand pipe and bucket as the safest and best arrangement for watering animals in cities. It is more comfortable for the horse, who has not to strain his neck against the collar to reach the water, the water is fresher and more palatable, and there is far less danger of its being contaminated with dust, dirt, and the germs of disease.

CANCER IN THE HORSE.—The *Indian Medical Gazette* says: *Melanotic cancer* is an ordinary cause of death in Bengal among gray and white horses. We can scarcely drive through Calcutta without seeing animals having the characteristic globular tumors beneath the skin.

SURGEON Sternberg (U. S. Army) says for the disinfection of ships, hospitals and dwellings no agent is likely to supplant sulphurous acid gas, produced by burning sulphur; for disinfecting clothing which can be washed, nothing better is known to science than the bichloride of mercury. The proportion recommended is one part to 1,000, or about one drachm to the gallon. Articles of clothing to be disinfected should be left in the solution for an hour or more.

Leading Articles.

THE DRINKING-WATER SUPPLY AND FILTH.

Next to pure air, good health demands pure water for drinking purposes at least—*i.e.*, water free from organic pollution. A great deal of sickness in small towns, villages, and farm houses, as well as in cities, arises from the use of impure water. Nothing relating to health, probably, needs looking after and inspecting more than the water supply. With the present vile system of storing excreta in pits in the ground, a large proportion of the wells in use throughout the entire country are contaminated, in a degree small or great, according to circumstances, with excrement dissolved by the storm water and washed into the wells, either in channels on or near the surface, or in those which are subterranean. It is well known that impure water may actually *flow* almost unchanged along underground channels rather than percolate and filter itself through the soil, for a very long distance. The rule that is often required to be acted upon in municipalities, that the well shall be a certain distance from the privy, is a very unsafe one to rest upon. A case is upon record in which it was proved beyond question, by careful experiments, that water had conveyed the typhoid poison three-quarters of a mile through the ground under a hill to a spring. The subterranean passage would convey dissolved salt, but not flour, in the water. The only safe way, therefore, is to have the excreta destroyed. When it is conveyed to a river, or even lake, it is only sent away to breed disease germs at the door of some distant fellow creatures. An English Royal Commission, reporting on the pollution of the Mersey in 1870, stated that "sewage discharged into running water is not materially changed for many hours by oxidation, and that there was not a river in England long enough to dispose of a moderate amount of sewage through oxidation. For this reason the Prussian Government has forbidden the pollution of rivers and seaports, by the discharge of sewage." Hence there is really no safety in wells or other usual water supply, except in complete destruction of all filth. By boreing down very deeply into the earth an abundant supply of pure water may usually be obtained. This practice is becoming more common in Great Britain and on this continent. In this way water free from all impurities washed from decaying natural organic substances on the earth's surface, as well as from collections of excrement, is obtained.

INDIVIDUAL HYGIENE.

Upon individual health, after all, more than upon anything else, will depend the extent to which the cholera will develope and spread should it reach Canada this coming summer. The low forms of organic life which, it appears almost conclusively, constitute the germs of infectious or epidemic diseases, live solely upon putrefying organic matter, either within the body or outside of it. If the body be pure, free from worn out waste substances of every sort, it is believed by the best authorities that these germs of disease will not develop and multiply in the body even should they be taken into it in any way. It is therefore of the first importance that each and every individual attend well to the bodily condition. One cannot be in absolutely good health and have a pure body in the midst of unhygienic surroundings—with the habitual use of foul air and water. But even with breathing a somewhat impure atmosphere, as from neighboring foul sources, perfectly good living in all other respects, would most probably secure immunity from the development of the infection within the body. The one chief cause of waste impurities in the body is over-eating—eating more than the nutrient organs can digest, assimitate and dispose of —more than is needed for the due performance of the bodily functions; while excesses of all sorts weaken the nutrient functions and render the organism less able to throw off the waste of the body or other impurities. The strictest temperance in all things is therefore of the first consequence. With a wisely judicious moderation in eating, plain,

digestible but nutritious, well cooked foods, with thorough mastication, and the careful avoidance of all foods not absolutely fresh and pure; drinking no water that has not been thoroughly boiled; careful attention to the condition of the skin and bowels—keeping these organs free from waste putrefying matters; and with regular habits as to exercise and sleep, and a tranquil fearless mental condition, no one need have any fear of the cholera;—excepting fear for those who do not practice such habits. But when the cholera makes its appearance amongst us, it will then be too late to secure immunity from it by only then commencing good living. Those who are not now living as above indicated should commence to do so at once.

THE DISPOSAL OF HOUSEHOLD AND OTHER REFUSE.

The one great aim of the Sanitarian is to promote absolute cleanliness everywhere. With absolute cleanliness everywhere, there would be but very little sickness.

Is there one who will deny that nine-tenths, if not ninety-nine hundredths, of all the cases of disease which afflict humanity are caused directly or indirectly by waste matters either in the fluids of the body or in proximity to our dwelling places—by decomposing, putrifying excrement and household refuse of one sort or another?

Disease as caused by waste substances within the body which never had been thrown off by the excretory organs, is a matter of individual concern, and the subject is treated of under the head of individual hygiene, on another page; disease caused by waste substances outside the body, is a matter for communities to consider.

At the present time, the question of the best method of disposal of all refuse—of the body, of the household, of the street—is receiving more attention probably than any other sanitary question. The SANITARY JOURNAL has always advocated the utilization of sewage and other excreta upon the soil—such as by sewage farming, and the burning of all other refuse. It is now proposed to burn all except the absolute fluids in large furnaces specially constructed for the purpose. One of these, in operation in London, E., is described elsewhere. It must be confessed that but for depriving the soil of certain essential elements in excremental matters, and so gradually exhausting it, the burning process would be by far the best. And it is possible that with the present tendency for man to congregate in large cities, and the difficulties in the way of practically utilizing sewage or excreta in other forms upon the soil, that some other method for preventing soil exhaustion may be more practicable.

In a lengthy and exhaustive paper by J. M. Keating, of Memphis, Tenn, on "the ultimate of sanitation by fire," read at the last meeting of the American Public Health Association at St. Louis, Mo., published in *The Sanitarian*, Feb., 1885, the author advocated the abolition of all privies and underground drains, or vaults or sewers, and the enactment of a law, with stringent penal clauses, forbidding the storage of excretal matter in vaults or pits, or its attempted assimilation in sewers (where decomposition has plenty of time to do its deadly work, owing to want of flushing), and having this and all forms of house and street wastes subjected to the ordeal of fire, the only purifier. "This," said he, "is the ultimate of sanitation. That way lies the pressure of sanitary experience; that way lies perfect sanitation, as perfect as human beings can accomplish, and in no other way can it be even approximated. Everything else has been tried, and failure has resulted. A brief recital of the genesis of sanitation will prove this. From the brutalizing habit of the Middle Ages, when the excreta of towns and cities was dumped into the unpaved streets, there to fester and decompose, an ever-increasing sea of pollution and death, it was but a step to the privy, the storehouse where death has found for centuries a constantly reinforced arsenal of disease to do his work of decimation, polluting earth, air and stream. The bucket system—still in vogue in South

America, in China, and in some European cities—was an improvement on this only so far as that the excreta was taken from under the noses of the citizens. Sewers were but one step further as a mechanical means of removal—simple and available where water was to be had, but deadly and dangerous because of the gas evolved from decomposing excreta, and its steady pollution of the rivers and bays into which it flowed. An improvement on this is the disposal of sewage on farms by precipitation, or by the intermittent downward filtration system, or its manufacture into poudrette, or by the pneumatic system of Liernur. By these latter systems river and harbour pollution is avoided, but the manufacture of sewer-gas goes on, and soil saturation is still a result. Partial or utter failure by these processes points plainly to the use of fire as the only means of utterly destroying the most potent factor in the dissemination of disease, of killing the germs that find in animal excreta their nidus—their means of life and perpetuity. And until they are utterly destroyed sanitarians will still find work to do, preventive medicine will still be a study, and preventive diseases still continue to lead all others in the work of death and decimation among the most industrial populations, thus occasioning a loss to the State greater than all others, fire, flood or tornado combined. When a physician undertakes the work of cure he does not ignore the final means; he is not content to partially cure his patient, he does not discharge him until he leaves him free from the disease of which he had been the victim. The sanitarian, like the physician, must leave his patient well; he must leave the city, the town, the village well, free from all possible pollution of earth, air, and water, free from all transmissable germs by either of these elements. To attain to this, the privy, the cesspool, the midden, the sewer, the graveyard and cemetery must be abolished. The crematory must take their place."

The writer sums up his paper as follows:—"The conclusion is legitimately reached that the cremation of excreta and all household wastes and street wastes would, (1) preclude the possibility of the return of such wastes in any deleterious form, as is the case now universally. (2.) It would save to all cities two-thirds of their present water supply, and thus increase the quantity for personal sanitation. (3.) It would put a stop beyond all question to soil saturation and sewer-gas. (4.) It would reduce scavenging to the minimum of expense, and save much of the cost of hauling and of great sewerage works like those of Boston and London. (5.) It would put a stop to all the nuisances complained of from defective plumbing. (6.) It would prevent the silting up of harbors with excretal matter, and their being choked with silt. (7.) It would prevent the pollution of rivers, and so prevent the wholesale destruction, as is now the case, of fish, the poor man's free food crop. (8.) Equally applicable to hamlets, villages, towns, and cities, it would put a stop to the privy and cesspool system, and thus prevent the saturation of soils, which frequently drain into the water-courses that are the sources of supply for great cities. (9.) It would solve all the problems that now vex sanitarians from house connections to the outflow, through which sewage finds its way into rivers and harbors. (10.) It makes a finality of all the wastes of cities, of every kind, character, and description, the result being, according to Shaws's method, an ash of great value to farmers, and clinkers that have a special commercial value for builders.

TOO FILTHY FOR A CHRISTIAN.—It is related in the life of Rev. J. B. Finley, the Ohio Champion of Methodism, that he was holding a quarterly conference among the Wyandot Indians. During the meeting one Indian made complaint against another. Finley asked what was the charge. The complaining Indian said he charged the other indian with being too nasty and filthy for a Christian. "Look," said he, "at his blanket and clothes. How dirty! Too nasty! "Can't be a Christian and be so dirty as he is." When the accused Indian was asked what defence he had to make, he said, "I got no squaw. I can't be clean." The other Indian retorted, "That no excuse. Plenty of squaws around here. You ought to get one, and clean up."

Recent and Current.

A DOMINION BOARD OF HEALTH for Canada, the Chicago *Sanitary News* states, "has long been urged and labored for by our friends across the line, and the desired action seems about to be realized." This is news, certainly, but it happens not to be true, like much more that comes from Chicago. There will be no Dominion board of health this year, though we trust that next year the Government will take steps to organize a sub-department of health. We may inform our contemporary that the Minister of Agriculture has already (and not "shall have") "cognizance of quarantine and other federal questions" relating to health, mortuary statistics, &c., and it would be but a simple matter to organize in connection with his department a Dominion Bureau of Health.

A NEW NATIONAL BOARD OF HEALTH for the United States, we may state, with accuracy, is not likely to be organized this year. We learn, on evidence which appears to be conclusive, that "the present Congress has decided, in accordance with the trite maxim that 'it is not safe to swap horses while crossing a stream,' and that it is better to make appropriation for the protection of the public health, to be used at the discression of the President, under the auspices of the National Board of Health, *as at present constituted*, than to undertake the constitution and organization of a new and different board in the face of the threatened invasion of cholera." And Congress is probably the more inclined to this by reason of divided counsels among sanitarians and "would-be sanitarians."

THE PLUMBERS almost everywhere are asking for official inspection of work. This is as creditable to them as it is pleasing to the public. The *Hydraulic and Sanitary Plumber*, of New York, the official organ of the Master Plumbers' Associations of New York, Brooklyn, San Francisco and other cities, and by the way, the best and liveliest paper of the kind published in the United States, excepting *The Sanitarian*, says, "we do not hear that the candy-makers and wall-paper men, to say nothing of others of the same genus, are exhibiting any anxiety for official inspection of the work they offer to the public. It has remained for the much vilified plumber to lead off in this direction. He is nowadays found not only acquiescing in the attempts of the law-makers to protect the public health, but actually asking for such legislation where it has not already been had." The sanitary wall-paper makers and sanitary confectioners may not come to the front with promptness. "The plumber who is up to his business will always favor sound sanitary laws and aid in their enforcement. They protect him as well as his customers."

IN TORONTO the leading plumbers appear to be very active in favor of a system of inspection of their work. A "Plumber" writes thus to a morning paper: "Plumbers' guilds are valuable in the Old Country, and they would be doubly so in Canada, for the powers that be seem to forget that the air can be poisoned by inefficient sanitary appliances quite as much as the stomach can be poisoned by drugs. It is obvious that 5,000 members could be brought together in Toronto, and a society might open its arms so as to include Ontario, and become a power felt by the Governments in power, which would compel them to legislate with a view to the health and comfort of the public."

THE SANITARY ASSOCIATION of Toronto held its regular monthly meeting on Monday, the 2nd inst., and the room in the Canadian institute was well filled with interested listeners. Mr. David B. Dick, architect, read an interesting paper on "Ventilation." He said, "While men could, in the ordinary circumstances of civilized life, abstain from eating or drinking until suitable food and drink were within their reach, they could not refrain from breathing. It was, therefore, of the highest importance, that the air around them should be always pure. The normal condition of human life was that man should die of old age. How few were the instances in which he was allowed to live out his days! The constant breathing of vitiated air was undoubtedly one of the most

potent factors in bringing about this condition of things. Its effects were not less, but more dangerous, because they were subtle. The object of ventilation was to provide people indoors with as pure air as they would breathe out of doors."

SOME THEORIES OF VENTILATIION, Mr. Dick said, had been founded on the supposition that carbonic acid gas, being heavier than any of the other constituents of the air, would fall to the floor and could be drawn off from there without disturbing the other and lighter elements. The law of the diffusion of gasses proved this view to be erroneous. Mr. Dick produced two thermometers and tested the atmosphere in the meeting-room. Near the ceiling it was 73°, and at the floor 52°. These figures, he said, went to show how difficult it was to warm uniformly, any room by direct radiation."

THE PRINCIPLE and plan of warming and withdrawing the foul air from a room advocated by so good an authority as Mr. Dick, we are pleased to find, are those always contended for in this JOURNAL, and in the face of much adverse action. This, especially in regard to the removal of the foul air. We have always believed that this may be most readily removed from the upper part of the room. Warm air being admitted below, in its ascent to the ceiling, as Mr. Dick says, "would carry with it the vitiated air and the watery vapour with its organic impurities; and if the outlet were there at the ceiling it would sweep them both out of the room without giving them a chance to cool and fall down again amongst the pure air."

OTHER CITIES would do well to follow the example of Toronto and organize sanitary associations. It is a great drawback and very discouraging that the work of carrying out anything of this kind always falls upon a few individuals, who rarely get from the benefitted public even thanks for their trouble. The most wealthy people, large "property-owners," are, as a rule, very indifferent about such things, though they are the ones most benefitted by sanitary improvements in a city, and usually suffer most from sanitary losses when an epidemic comes. But they are so afraid of parting with a little of their money that they won't see it till it is too late (sad words), more often, probably, through ignorance of the value of sanitary work than from any other cause.

THE LADIES' PROTECTIVE SANITARY ASSOCIATION, of New York City, is now fully organized. Already it has made itself felt. The manure contractor, who was originally indicted through the efforts of the association, has been fined $250 for failure to have the nuisance removed. The proposed sanitary league to be formed of the various sanitary associations of the city and of parties interested in sanitary reform is likely to be a success it appears.

THE REPORT OF THE BOARD OF HEALTH of New York for the quarter ending Dec. 31, 1884, shows that during that period 95,634 examinations were made by the Sanitary Inspectors, and the number of causes of complaint returned was 12,636. The number of milk inspections was 1,182; specimens examined, 1,923; complaints entered, 22; arrests made, 14, and fines collected, $850. Over 146,000 pounds of meat and fish were condemned as unfit for food. The number of houses for which plumbing plans and specifications were received was 403; number of plans examined and reported to the Board, 246; houses reported as begun during the quarter, 468; finished, 548; houses reported in violation of the law in respect to plumbing and drainage, 319; notices issued to owners of the same, 146; inspections under the law regulating the plumbing and drainage of new houses, 17,835; inspections of the plumbing and drainage of old houses made on complaint of citizens, 181.

THE EFFECTS OF SEWER GASES, it may be observed in this connection, are of much wider range than many people, even physicians, know of. Dr. Morrill is endeavoring to trace out the less marked effects of these gases, and publishes in the Boston *Medical and Surgical Journal* some interesting results of his observations. He believes, what is doubtless true, that "sore-throat, neuralgia,

rheumatism, pneumonia, gout, asthma, and nervous prostration are often caused by sewer-gas, this opinion being formed on cases which have come under his treatment." In all such cases defective drainage was found to exist in the dwelling, and when remedied, or the patients were removed, a cure immediately followed. "Sewer-gas poison," he says, "seems to seek out the patient's weak spot, and often brings discredit upon the physician, whose inability to relieve his patient is due to his failure to appreciate its unlimited powers of mischief."

THE CANADA LANCET for March says, "with the advent of spring and summer the invasion of cholera may be looked upon as one of the probabilities, and therefore the authorities should set about precautions as actively as possible for its prevention. There may be still some doubting Thomases who cannot believe that sanitary measures are of any avail to protect the people from these so-called visitations of Providence. We trust, however, that the authorities will not be influenced by any such foolish notions, but will put into vigorous action all the sanitary resources of the country."

THE CHOLERA AND ITS PREVENTION is still attracting a great deal of attention in medical and other journals on both sides of the Atlantic, and we feel justified in giving, as we do, a good deal of space still to the subject, though so much has already been given. The United States consul at Genoa, in a communication to the Home Government, says, "since the outbreak of cholera at Toulon and Marseilles a continual purification of streets, alleys, private and public houses, has been kept up, the most powerful disinfectants being used for the purpose. The rules were rigid in regard to household cleanliness, and the use of disinfectants in whitewash, and if the owner of an establishment of any size heeded not the orders of those in authority the work would still be performed, and at the expense of the proprietor. The Sunday excesses among the laboring classes proved a powerful feeder of the epidemic. Let a city or town have officials who energetically and fearlessly fight everything which has a tendency to prey upon public health, granted the people abuse not nature; let substantial food be one's daily portion; to these things add a frame of mind prepared to face calmly and bravely whatever trials and vicissitudes may cross one's path, and you have an armor that will, I am positive, in nine hundred and ninety-nine cases in a thousand baffle the type of cholera which has lately raged in Genoa."

THE DISCOVERY OF THE CHOLERA BACILLUS cannot fail to lead to more successful means of preventing the disease, though it may be said by some who are not very far seeing, as it has been said regarding the discovery of the tubercle bacillus, that it has not led to practical results. If the coma bacillus is the cause of the cholera, it is safe to predict that if we get rid of the bacillus we shall also get rid of the cholera. When everything relating to its life history has been learned—how and where it thrives best, how it is propagated, how it travels from place to place, and from organ to organ, then it may not be difficult to destroy it, and the practical part will come in.

THE BATTLE OF THE BACILLI, as a late London, Eng., medical journal has it, "is waxing warm all along the line, and at the present moment it must be confessed that the tide of victory is turning towards Professor Koch. It has become very evident to the impartial observer that, as the search after micro-organisms goes on, the existence of more than one comma-shaped parasite must be admitted. Many good observers have been familiar with them for a long time past as occurring in the intestines, or even in the upper regions of the allimentary canal. Several trustworthy experiments have been lately recorded, however, which go far to prove that although indistinguishable in form from one another, these various bacilli are endowed with very distinct properties, and this is most remarkably exhibited when they are cultivated in various media." Koch is becoming more than ever convinced that the comma bacillus is the true cholera bacillus.

A NEW SERIES OF EXPERIMENTS, the results of which have just been published (*Deut. Medicin.*, Wochenschrift, No. 3, 1885), by Dr. Deneke, of Gottingen, are in striking accord with the results obtained on the same line of investigation by Dr. Heron, referred to in the February number of THE SANITARY JOURNAL. Dr. Deneke has found that the bacillus of Asiatic cholera and the bacillus of cholera nostras behave in a strikingly different manner when cultivated on gelatine and potato respectively. He has carried his observations further, and has applied similar tests to an altogether new organism, which he has succeeded in obtainig from decomposing cheese.

THE NEW "CHEESE SPIRILLA" are "almost identical in form with the bacilli of both kinds of cholera, although by a practised eye a difference in shape and size can be detected, the cheese spirillum being the smallest of the three, and differing from Finkler's bacillus in possessing a uniform thickness throughout its whole length. By means of infection experiments upon animals the different properties of these three varieties were still more strongly borne out." The Guinea-pig was found to withstand the action of the bacilli of cholera-nostras and decayed cheese, whilst "an exactly similar infection with Koch's bacillus put an end to its existence in about six hours." Dr. Denke believes that the two former varieties are harmless saprophytes which have no causal relation whatever either to cholera-nostras or to Asiatic cholera.

OVER STUDY IN BALTIMORE.—In a report just published of the Baltimore dispensary, Dr. Van Bibber says, "the statistics of the year show a great increase of nervous diseases among school children. The number of cases of St. Vitus' dance is remarkably large, and headache, insomnia and neuralgia, heretofore considered to be troubles of adult life, are now frequently brought under observation in young children. The question of over-pressure in the public schools has lately caused much discussion in England, and I have no doubt that the tendency of the present system is to increase the development of nervous diseases among the younger pupils of our public schools. The number of studies and the frequent examinations have undoubtedly an injurious effect upon the more sensitive children of a class, subjecting them to overstrain and anxiety which may result in the production of the unusual forms of nervous disorder which have been brought under observation."

A WRITER IN THE *Canada Medical Record* believes it to be "the duty of the physician to discourage undue mental exertion." From our ancestors, he says, "who might generally be described as a hardy race of men with great stomachs and no brains, we are developing into a physically inferior race with large brains and irritable digestive apparatus. A judicious exercise of mind and body should be the aim of the man who would make the most of himself. As I write there is too much athletics in the air, but doubtless it may do good by enticing the bookworm from his books and by making the pale student breathe cold, exhilarating air and exercise his flabby muscles. At any rate, if we must have an extreme in Canada, by all means let us raise muscular, eupeptic, broad-chested, good-natured samples of Anglo-Saxon mediocrity, rather than dyspeptic, myopic, anæmic geniuses, with abnormal brains and endless stores of knowledge.

THE MICHIGAN STATE board of health is threatened with the usual biennial attack, and in the *Legislative Journal* for Feb. 18th, is a notice that a bill will be introduced in the Legislature to abolish the board. We have always been in accord with the opinion expressed by the Hon. Mr. Crooks in regard to a health board for the Province of Ontario, at the time when he was chairman of a public health committee in the Legislature, that boards were irrepressible bodies and not the best form of organization for dealing with matters of this kind, and that a sub-department associated with one of the departments of the government would be much better. It may be different in the United States. Certainly the Michigan board has done a vast amount of good work, and it would be

little short of a calamity to have it abolished unless it were substituted by some other organization for promoting the public health.

THE INTEMPERANCE QUESTION has now for some time been attracting more than usual attention in the Dominion, but more especially in Ontario. Nearly all who are taking any interest pro or con in the Scott act or other prohibitory measures, are intemperate in their views and actions, either on one side or the other. But it is a marvel that so many who are usually regarded as intelligent and able men seem to suppose that man can be forced by acts of parliament to abstain from the use of that which any sane man who will with an unbiased mind investigate the subject must be convinced has much good in it as a food if only properly used; so many who take such narrow views as to only see as it were one cause of intemperance when there are many causes. The one great cause as every one knows is want of self-control in the inner man, and not one of those who would unman manhood by prohibitory acts seems disposed to put out a hand to help develop that self-control by which alone man can become temperate in the use not only of alcoholic beverages but of everything else; and which can only be fully developed in a well ballanced mind and a healthy body.

THAT THERE ARE FOOD PROPERTIES in alcoholic beverages is a fact of which every practicing physician must have almost daily the plainest and most convincing evidence. When wine will revive the flagging almost suspended vital powers, and sustain life for an almost indefinite time, as no other known substance will, can anyone doubt that it may be employed as a useful food in health if properly used? A great deal of the "bosh" which comes from such men as Dr. B. W. Richardson, of London, Eng., is ill-considered fallacy. As for example that which has been the rounds of the press and relates to wine quickening the heart's action when the heart should rather rest. Alcohol will on the other hand reduce the action of the heart when that organ is quickened from sheer debility and the body needs sustenance, as every physician knows, and as the writer has experienced in his own person and frequently observed in others. Beef steak and bread and butter will quicken the action of the heart. And a moderate amount of alcohol will not produce a more marked effect in this way than will beef steak and bread and butter.

IF NOT AN ESSENTIAL of life, and in the present advanced state of society it seems to be almost indispensible, alcohol is less a luxury than tea and coffee, and when taken into the body in small quantities it is utilized as respiratory food at least, and probably supplies elements for the nerve tissue. Man can doubtless live and enjoy good health without it, and much better without it than with half a dozen glasses of beer or wine or spirits every day, for this would be far too much. But it is one of the good things which the Creator has permitted progressive man to find out, and in hands controlled by a well ballanced mind, it adds to the pleasures of life, and we believe to the length of life, for with it man can work with less food and less effort of digestion. And it is one of the good things which it is safe to predict man will always get in one way or another in spite of all the acts of parliament that can be enacted. Time will probably convince men that the way to make their fellowmen temperate is not by acts of parliament, but by developing in them the power of self-control—physical and mental vigor—*mens sana in corpore sano.*

TOBACCO is an entirely different thing, and it has never been even suggested that it is in any degree a food. It is rather a vile poison, the use of which even tobacco dealers hardly defend further than as a pleasant social habit—and a low disgusting one it is, Spurgeon to the contrary notwithstanding, and tends to create a morbid desire for the counteracting effects of alcoholic stimulants. In increasing the duty on this worse than useless weed, Sir Leonard Tilley has acted so wisely that there seems not to have been throughout the Dominion one to question

the wisdom of the act—though some manufacturers and dealers did enter a mild, hopeless protest. We hope Sir Leonard will still further increase the duty.

"OUR NATIONAL FOODS," manufactured by Messrs. Fish & Ireland, of Lachute, Q., are such nutritious and digestible articles of diet, and withall so delicious, that we feel we cannot say too much in their behalf in order that they may become universally tried. And few who try them, we are satisfied, will fail to continue to use them. The rolled oats and desiccated wheat for breakfast dishes, and the prepared "patent barley" for custards and puddings, are especially valuable for their highly nutritious and digestible properties, while the "Baravena milk food" is highly recommended by many well known Canadian physicians for infants and children, and also for weak convalescents. This is considered better than the much higher priced imported foods of a similar nature.

THE VENTILATION, purity of the atmosphere, and general comfort in the cars on the Canadian Pacific road, we are pleased to find, are in a marked degree superior to those on the Grand Trunk, while the closets are very much freer from disagreeable smell. We trust that as the road becomes more used there will be no change for the worse in these conditions. So far as we have been able to observe, too, the "time" made is much better on the C. P. R. than on the G. T. These are all very important considerations for travellers. A vast amount of valuable time has been lost on the Grand Trunk.

MONTREAL AND OTTAWA are seriously considering the advisability of at once making preparations for the construction of furnaces for the burning of all their refuse and excremental matters. In Montreal, indeed, it has been decided to go on at once with the project. We agree with the *Canada Medical Record* in that it hardly seems necessary to incur the expense of incinerating the excreta now in the "10,000 cesspools" in the city. The putrefying masses have about done their worst in poisoning the air and saturating the soil. The *Record* suggests that the present contents of the cesspools be buried in deep pits and covered with earth. Yet it would require one pit of about two acres in extent to bury it all at the depth of the average of that of the cesspools. And what would be done with the land thereafter? We do not see that a number of pits instead of one would be less objectionable. It might be less expensive to incinerate the excreta in the city than cart it away to cheap or waste land outside the city.

THE USE OF DRY EARTH CLOSETS, the *Record* believes, would not be advisable with "a class belonging to the lower and more ignorant gra des of society, who are in the main regardless of any sanitary precaution the utility for which they cannot be taught to understand." Surely there is no class of people in Canada who could not be taught to daily mingle their excreta with dry earth, or more easily, with their coal ashes. However loosely they were to do it, it would be a hundred times better than the present system. Water closets would hardly be safe in the hands of such a class.

THE LAST REPORT on the mortuary statistics of the principal cities in the Dominion, from the Department of Agriculture and Statistics, brings out some interesting features relating to the ratios of mortality according to nationalities and also according to religious denominations. Some comments on these are in preparation but we must hold them over for the next number.

THERE IS AN INVITING FIELD for inventors to invent a more perfect method of ventilating railroad cars. It is marvellous that some system has not been discovered whereby abundance of pure air without dust and cinders could be taken into the cars. The sleepers at night are so disgustingly "close" from foul air re-breathed and re-breathed time and time again that many who think there are other essentials of health besides sleep in a berth or bed, wisely decline to be shut up in one. It is bad enough in an ordinary car but vastly worse in a sleeper.

Miscellaneous.

THE ENGLISH courts have decided that home lessons set by teachers in the public schools cannot be enforced.

THE JEWS IN TOULON and Marseilles, it is stated, have scarcely been affected by the cholera. The Jewish journals attribute their immunity to an observance of the dietary and hygienic laws of Judaism.

SOME ONE has said that the man who is curious to see how the world could get along witout him can find out by sticking a cambric needle into a millpond, and then withdrawing it and looking at the hole.

DR. MATHESON, superintendent of the Deaf and Dumb Institute, Belleville, states that among no fewer than 661 deaf-mute children who have been under his care, he has been unable to trace one instance in which the parents of his charges were similarly afflicted.

THERE is a prevalent notion that the infection from mild cases of the common infectious diseases of childhood is not likely to do any particular harm. This is an error that consists among all classes, and often is only seen when two late. A mild case may give rise in another person to a disease of a very malignant type.

DR. ELLIOT, Medical Health Officer, Orillia, *(Packet)*, has issued the following notice :— In accordance with the Public Health Act, the Head Master of Orillia Public School is empowered, and is hereby requested, to send all children affected, or supposed to be affected, with any contagious or infectious disease, to their homes and forbid their return to the school till they present a medical certificate of complete freedom therefrom.

ATMOSPHERIC PURIFICATION BY ELECTRICITY.—Referring to the conclusions of M. Romain Vigourous in the *Progrès Médical* regarding the prophylaxis of cholera and the efficient results obtainable by the daily practice of static electrization, the N. Y. *Medical Times* gives a description of a system or apparatus now being manufactured in New York : By means of a very simple arrangement of an induction or static electric machine (requiring no more power than a sewing machine to operate, and occupying about as much space) and a small exhaust fan operated in combination, the atmosphere of a closed room is maintained in circulation in contact with hundreds of continuous diffusive discharges of electricity, whereby the garbage of the atmosphere is consumed ; carbonic acid, sulphureted hydrogen and other noxious gases decomposed, free oxygen converted into ozone, and the air returned to the room in its virgin purity. In short, it is a sanitary wonder and strictly in accord with the chemical operations in nature during the thunder storm, the wind storm and the snow storm.

IT HAS BEEN DISCOVERED by a Frenchman that three times as many unmarried as married men are attacked with cholera.

SOME head-cheese examined by Dr. Cyrus Edson, of New York city, contained borax, boracic acid, phosphate of soda and Venetian red.

FOR DISINFECTION of sputa and discharges from the bowels, and as a deodorizer, Dr. Sternberg, U. S. army, suggests a combination of permanganate of potassium with the bichloride of mercury. *(Med. News*, Jan. '85.) The color of the solution would be a safeguard against its being accidentally drunken. No chemical reaction takes place when these substances are combined, they being perfectly compatible. A solution of two drachms of each of the salts in a gallon of water would be strong enough for all practical purposes—about one part of each to 500 of water.

IMMUNITY FROM CONSUMPTION. — In the Cumberland plateau of Tennessee *(Detroit Lancet)* there is a remarkable immunity from consumption. The tract is 30 miles long by five or six wide, has a population of 6,000 people and has never had a case of phthisis. Dr. Wight, Sanitarian. studied the reasons for this remarkable immunity. He found the inhabitants farmers, primitive in all respects, almost devoid of what we call luxury. They worked and ate, and slept, regardless of the world about them. Their houses were windowless and often doorless. They only sought shelter, and neither consumption nor any other disease found foothold among them ; " the consequence of plain food and outdoor life."

BODILY PAIN is the evidence of some abnormal action which is interfering with the ordinary course of nature ; it is a danger-signal exhibited by the nervous system to show to the owner that some law has been transgressed, and some change effected in the nerve battery which regulates organic life, which has led to changes not consistent wit. health freedom suffering.

THE IMPORTATION OF RAGS into Canada has been entirely prohibited.

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WILL OUR CONTEMPORARIES across the line kindly credit this JOURNAL with articles when they copy from it?

Current Literature.

HARPER'S MONTHLY for March is a very attractive number. We have the "House of Orange," with portraits of many of the principal descendants of that great Protestant House, and "a glimpse of some Washington homes," with some very handsome illustrations of both exterior and interior. "At the Red Glove" and "East Angels" are continued, at considerable length. And there is an instructive and interesting paper on "the brain of man, its architecture and requirements." One paper of most worthy note, "Manifest Destiny," by John Fisk, must attract much attention. Fisk writes, "thus we may foresee in general how, by the gradual concentration of physical power into the hands of the most pacific communities, we may finally succeed in rendering warfare illegal all over the globe. As this process goes on, it may after many more ages of political experience, become apparent that there is really no reason, in the nature of things, why the whole of mankind should not constitute politically one huge federation, each little group managing its local affairs in entire independence, but regulating all questions of international interest to the decision of one central tribunal supported by the public opinion of the entire human race." With much other interesting preceding matter, we come to the editor's special department, with the old familiar and amusing "editor's drawer." In his "easy chair" the editor refers to the subject, now receiving a good deal of attention, especially in England, of improved dwellings for the poor, and draws attention to the efforts of Miss Hill, of London. She took fourteen of the worst houses there, and after being treated by the tenants, whom she went amongst, "with every disrespect short of personal violence," she "repaired the houses, drained, scrubbed, put them in proper order, and required prompt payment of the rent. The result has been the awakening of self-respect among the tenants, and the strongest regard for Miss Hill as a friend —and five per cent. interest upon her money invested. . . . The same intelligent humanity which characterizes Miss Hill's enterprise is evident everywhere, and it is interesting to see how much of the great contemporary work of wise charity is due to the earnest efforts and supervision of women.

'Why are the virtues, every one,
Pictured as women be,
If not to show that they in worth
Do more excel than we?'

Miss Hill insisted that the state was as much bound to prohibit the renting of unfit rooms as to prohibit the sale of adulterated food. Indeed, the tendency of the whole humane movement of the time is to reverse the moral indifference and every-body-for-himself theory that came in with the misunderstanding of the Bentham philosophy."

IN THE APRIL NUMBER of "Harper" we are promised an excellent "bill of are." Amongst other things, A wild-goose chase—I. The Rise, with seventeen illustrations; A collection of Chinese porcelains, with nine illustrations; Along the Rio Grande, with nine illustrations; Too much momentum, a very good story, by James Allen; Some Richmond portraits, with eleven illustrations; The Prince of Wales at Sandringham, by W. H. Russell, with fourteen illustrations; and How Faith came and went, another good story.

THE MARCH CENTURY is above the average, especially in illustration, in which it is most profuse. The initial paper, the "Land of the False Prophet," by R. E. Colston, abundantly illustrated, is especially attractive at this time. Khartoum we are here told "is a city numbering between fifty and sixty thousand people. Several European consuls reside there. The American consul was Azar Abd-el-Melek, a Christian Copt from Esneh, and one of the principal merchants. The European colony is small and continually changing; for Khartoum is a perfect grave-yard for Europeans, and in the rainy season for natives also, the mortality averaging then from thirty to forty per day. It is the commercial center of the Soudan trade, amounting altogether to sixty-five million dollars a year, and carried on by one thousand European and three thousand Egyptian commercial houses. . . . The city contained three thousand and sixty houses, many of them two-storied, each having from ten to one hundred and fifty occupants. Stone and lime are found in abundance, and the buildings are, after a fashion, substantial, the houses belonging to rich merchants being very spacious and comfortable. There are large bazaars, in which is found a much greater variety of European and Asiatic goods than would be expected in such distant regions. In the spacious market-place a brisk trade is carried on in cattle, horses, camels, asses, and sheep, as well as grain, fruit and other agricultural produce. Many years ago an Austrian Roman Catholic mission was established and liberally supported by the Emperor of Austria." "The rise of Silas Lapham" and "the Bostonians"

are of course continued. There are the "new astronomy," reminiscences of Daniel Webster" and "recollections of Charles O'Connor," with several papers relating to the civil war. The first edition of this number was almost at once exhausted.

HARPER'S BAZAR, besides containing from week to week portions of two novels—"Lazarus in London," by F. W. Robinson, and "White Heather," by William Black, gives much other instructive and entertaining reading, with many superb illustrations other than the usual fashion plates. There has been during the past few weeks a series of papers on "Women and Men." In the last number, in an article on "a little shirt of Nessus," it "goes for" the little knit woollen shirt worn now by many infants next the skin, and which we have no doubt, as the writer of the article endeavors to make plain, gives rise in many little ones to a great deal of suffering, by irritating their delicate skin. "When we look at the wool of these small garments under a microscope, and see the innumerable hooks and fangs and stilettoes of its tiny fibres, that seemed so delicate before, and then think of the velvety softness of a baby's skin, of its acute tenderness, and bring the two together in our minds, we shall ourselves shrink and shudder and fail to be surprised at any havoc the pretty little garment may make, while it assumes to our view the power, if not the proportions, of a real shirt of Nessus."

THE THERAPEUTIC GAZETTE, edited by Horatio C. Wood, M.D, Prof. Mat. Med. and Therapeut. University of Pennsylvania, and Robt. Mead Smith, M.D., Prof. Comp. Phys. in the same University. This is a monthly journal, of 72 royal octavo, double-column pages, devoted to pharmacology, in the broadest sense of that term, which includes the botanical origin, the chemical constitution, the physiological action and the therapeutical uses of drugs. It is the only journal in America thus devoted. It is a practical journal and is filling a want in the profession, attested by the fact that its *bona fide* subscription list has reached, it is said, the number of 12,000, and is still rapidly increasing.

N. W AYER & SON'S *American Newspaper Annual*, Philadelphia, for 1884, contains a carefully prepared list of all Newspapers and Periodicals in the United States and Canada, arranged by States in geographical sections, and by-towns in alphabetical order. It gives the location, county seat, and population of every county in the United States. From it you can learn the character of the surface, the nature of the soil, and its adaptibility to the growth of the various agricultural staples, of every State, Territory and County in the United States, and of each of the Canadian Provinces; the population of every State, Territory, County or County-seat; of all the large cities and towns, and of almost every place in which a newspaper is published; also the colored population and the Chinese population, and a great deal of other useful information.

A CAMEL will work seven or eight days without drinking. In this he differs from some men, who drink seven or eight days without working.

IT IS SAID that if a stammerer will emit the sound with which the word "her," begins, each word attempted to be uttered, he will soon be cured of his stammering.

A CLOCK is being introduced in Europe, warranted to run five years without winding or regulation. The Belgian Government placed one in a railway station in 1881, and it has kept perfect time ever since without winding.

IT IS SAID that there are four unique mountains in Lower California, two of alum, one of alum and sulphur mixed, and one of sulphur. The alum and sulphur are almost chemically pure. It is estimated that in these mountains there are 100,000,000 tons of alum and 1,000,000 tons of sulphur.

THE MORTALITY OF THE GLOBE, as given by a continental journal, which has made the computation, is as follows: Per minute, 67; per diem, 97,790; and per annum 35,639,835; whereas the births are 36,792,000 per annum, 100,000 per diem, and 70 per minute.

THE AVERAGE WEIGHT of a thousand children at birth (*N. Y. Med. Times*)—born in the Philadelphia Hospital—is 7 lbs., 4 891 oz. Five hundred were boys and five hundred girls. The average of the boys is 7 lbs., 7·956 oz., and of the girls 7 lbs. 1·725 oz.; practically, 7·5 for boys, and 7 lbs for girls.

EFFORTS to cultivate the tea plant are being made in several parts of Europe. In France, on the lower Loire, the plants have been extensively set; but it is still a question whether the leaves will retain their characteristic aroma on a foreign soil. In Sicily the plants set three years ago at Messina are strong and healthy, and have flourished in leaf and seed. Russia has also made the attempt.

A NEW "everlasting" wood pavement has been brought out in France says *The American Inventor*. The wood blocks are boiled in a solution of sulphate of copper, sulphate of zinc and chloride of sodium, mixed with heavy mineral oil, linseed oil and tallow. The blocks are afterwards compressed to about one-tenth of their original volume. In this state they are said to be practically unwearable.