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A Monthly Review and Record of

**SANITARY PROGRESS**

—EDITED BY—

**EDWARD PLAYTER, M.D.**

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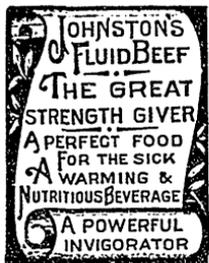
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# THE HEALTH JOURNAL.

A Record of Sanitary Progress.

VOL. XI.

SEPTEMBER, 1889.

No. 9

## EXTERNAL SOURCES OF INFECTION, ESPECIALLY THE AIR, THE GROUND AND THE FOOD.

THE following plain practical expose on the air, ground and food as sources of the infections of disease are extracts from an admirable and exhaustive address by Wm. H. Welch, M. D., Prof. of Pathology in Johns Hopkins University, Baltimore, delivered at the June annual meeting of the American Medical Association at Newport.

### THE AIR AS A SOURCE OF INFECTION.

It is universally admitted that many infectious agents may be transported by the air, but the extent of danger from this source has often been exaggerated. The methods for determining the number and kind of bacteria and fungi in the air are now fairly satisfactory, although by no means perfect. These have shown that while the number of living bacteria and fungi in the atmosphere in and around human habitations cannot be considered small, still it is greatly inferior to that in the ground or in most waters. Unlike fungus spores, bacteria do not seem to occur to any extent in the air as single detached particles, which would then necessarily be extremely minute, but rather in clumps or attached to particles of dust of relatively large size. As a result in a perfectly quiet atmosphere these comparatively heavy particles which contain bacteria rapidly settle to the ground or upon underlying objects, and are easily filtered out by passing the air through porous substances, such as cotton-wool, or sand. Rain washes down a large number of bacteria from the air.

That the air bacteria are derived from the ground, or objects upon it, is shown by their total absence, as a rule, from sea air at a distance from land, this distance na-

turally varying with the direction and strength of the wind.

A fact of capital importance and one of great significance is the impossibility of currents of air detaching [bacteria from moist surfaces. Substances containing pathogenic bacteria, [i. e. destruction to the body—infections] as, for instance, sputum containing tubercle bacilli or excreta holding typhoid bacilli, cannot, therefore, infect the air unless these substances first become dry and converted into fine powder. We are able to understand why the expired breath is free from bacteria and cannot convey infection, except as little particles may be mechanically detached by acts of coughing, sneezing, or hawking. Those bacteria, the vitality of which is rapidly destroyed by complete desiccation, such as those of Asiatic cholera, evidently are not likely to be transported as infectious agents by the air, if we except such occasional occurrences as their conveyance for a short distance in spray.

The only pathogenic bacteria which hitherto have been found in the air are the pus organisms, including the streptococcus in a series of cases of diphtheria, and tubercle bacilli; but no far-reaching conclusions can be drawn from the failure to find other infectious organisms when we consider the imperfection of our methods and the small number of observations directed to this point. The evidence in other ways is conclusive that many infectious agents—and here the malarial germ should be prominently mentioned—can be and often are conveyed by the air. . . . .

We are not, of course, to suppose that infectious germs floating in the form of dust in the atmosphere are dangerous only from the possibility of our drawing them

in with the breath. Such germs may be deposited on substances with which we readily come into contact, or they may fall on articles of food where they may find conditions suitable for their reproduction, which cannot occur when they are suspended in the air in consequence of the lack of moisture.

From these facts, what points of view present themselves to guide us in preventing infection through this channel? Surely something more than simply by abolishing foul odors,

There are two indications which apply especially to the prevention of the transportation of disease germs by the air. One is the necessity of guarding, as far as practicable, against the desiccation, when exposed to the air, of substances which contain infectious germs not destroyed by drying, and another is free ventilation.

For no disease is the importance of the first of these indications so evident and so well established as for tuberculosis, the most devastating of all infectious disease. Against this disease, formidable as it may seem to cope with it, the courageous crusade of preventive medicine has begun, and is destined to continue.

It is now generally recognized that the principal, although not the sole, sources of tuberculous infection are the sputum of individuals affected with pulmonary tuberculosis and the milk of tuberculous cows.....

By means of free ventilation, disease-producing micro-organisms which may be present in the air of rooms are carried away and distributed so far apart that the chance of infection from this source is removed or reduced to a minimum. It is a well established clinical observation that the distance through which the specific microbes of such diseases as small-pox or scarlatina are likely to be carried from the patient by the air, in such concentration as to cause infection, is small, usually not more than a few feet, but increases by crowding of patients and absence of free ventilation. The well-known experiences in the prophylaxis and treatment of typhus-fever are a forcible illustration of the value of free ventilation.

It is, of course, not to be understood that by ventilation we accomplish the disinfection of a house or apartment. Ventilation is only an adjunct of such disinfection which, as already mentioned, is of first importance. Time will not permit, nor is it in the plan of this address, to discuss the details of such questions as house disinfection, but I may be permitted to say that the methods for disinfecting apartments have been worked out on a satisfactory experimental basis, and should be known at least by all public health officers. Whether it be pertinent to this occasion or not, I cannot forbear to add my protest to that of others against placing reliance upon any method hitherto employed of disinfecting houses or apartments by fumigation....

#### THE GROUND AS A SOURCE OF INFECTION.

That the prevalence of many infectious diseases depends upon conditions pertaining to the soil cannot be questioned, but the nature and extent of this influence have been and are the subjects of lively discussion. The epidemiological school led by Pettenkofer assigns, as is well known, to the ground the chief and even a specific and indispensable influence in the spread of many epidemic diseases, particularly cholera and typhoid-fever.... The exclusive ground hypothesis has become an ingenious and carefully elaborated doctrine with those who believe that such diseases as cholera and typhoid-fever can never be transmitted by [direct] contagion....

The ground, unlike the air, is the resting or the breeding place of a vast number of species of micro-organisms, including some which are pathogenic. Instead of a few bacteria or fungi in a litre as with the air, we find in most specimens of earth thousands, and often hundreds of thousands, of micro-organisms in a cubic centimetre. Frankel found the virgin soil almost as rich in bacteria and fungi as that around human habitations.

This vast richness in micro-organisms belongs, however, only to the superficial layers of the earth. Where the ground has not been greatly disturbed by human hands there is, as a rule, about three to five feet below the surface an abrupt diminution in

the number of living organisms, and at the depth where the sub-soil water usually lies, bacteria and fungi have nearly or entirely disappeared. . . . Of course, the number of bacteria and the depth to which they penetrate will vary somewhat with the character, especially the porosity, of the soil and its treatment, but the important fact that all, or nearly all, of the bacteria and fungi are retained in the ground above the level of the sub-soil water will doubtless hold true for most situations. . . .

We have but meagre information as to the kinds of bacteria present in the ground in comparison with their vast number. . . .

Among the pathogenic bacteria which have their natural home in the soil, the most widely distributed are the bacilli of malignant œdema and those of tetanus. I have found some garden earth in Baltimore extremely rich in tetanus bacilli, so that the inoculation of animal in the laboratory with small bits of this earth rarely fails to produce tetanus. In infected localities the anthrax bacillus and in two instances the typhoid bacillus, so far as it was possible to identify it, have been discovered in the earth. There is reason to believe that other germs infectious to human beings may have their abiding-place in the ground; certainly no one doubts that the malarial germ lives there. As the malarial germ has been shown to be an organism entirely different from the bacteria and the fungi, we cannot apply directly to its behavior in the soil and its transportation by the air, facts which have been ascertained only for the latter species of micro-organisms. . . . .

In view of the facility with which infectious germs derived from human beings or animals may gain access to the soil, it becomes a matter of great importance to determine how far such germs find in the soil conditions favorable for their preservation or their growth. . . . .

The experiments which have thus far been made to determine the behavior of infectious micro-organisms in the ground have related especially to the bacilli of anthrax, of typhoid fever, and of cholera, and, fortunately, these are the diseases

about whose relations to the ground there has been the most discussion and concerning which we are most eager to acquire definite information.

As regards anthrax bacilli, it has been determined that in ordinary garden or field earth they do not multiply, but in earth contaminated by blood, urine, or faeces their reproduction can occur. They can grow on various vegetable substrata. There is no reason to doubt, therefore, that the anthrax bacilli can find in or on the ground suitable conditions for their multiplication, although such conditions are not everywhere present. For durable infection of the soil with anthrax bacilli it is, however, more important that these bacilli should find there suitable conditions for the formation of spores, than that they should be able simply to multiply. The vegetable forms of anthrax bacilli would not, as a rule, be able to survive for a great length of time the hostile influences which they are likely to encounter in the ground, such as insufficient nutriment, and the attacks of saprophytic organisms. On the other hand, against these injurious influences the anthrax spores have great resistance. In the superficial layers of the ground the anthrax bacilli may often find those conditions which are most favorable for the development of their spores. Feltz finds that anthrax bacilli may undergo a progressive diminution in virulence in the soil. If this should be true likewise of other infectious micro-organisms, we should be able to account, in some instances, for the variable degree of virulence which clinical observation indicates that certain agents of infection acquire. . . . .

Of greater interest to physicians is the behavior of typhoid and of cholera bacteria in the ground. As has already been intimated the ground is regarded by Pettenkofer and his school as the principal breeding-place of these micro-organisms outside of the body. Inasmuch as the cholera and typhoid bacilli may multiply on various vegetable substrata and substances derived from animals, at temperatures often present in the ground, it is evident that here

and there conditions may be present for their growth in the ground, but this growth is likely to be soon interrupted by the invasion of ordinary saprophytic organisms and other harmful influences. The typhoid bacilli are more hardy in resisting these invaders than are the cholera bacteria, which easily succumb. It is not, however, necessary that these organisms should multiply in order to infect for a considerable time the ground; it is sufficient if their vitality is preserved.....

The weight of bacteriological evidence is opposed to the supposition that the bacteria of Asiatic cholera preserve their vitality for any considerable time in the ground or in the excreta..... But unlike the cholera bacteria, the typhoid bacilli may exist for months at least in the ground and in the faecal matter, holding their own against the growth of multitudes of saprophytes. This difference in the behavior of cholera and of typhoid germs is in harmony with clinical experience.

As regards other infectious bacteria, I shall only mention that tubercle bacilli, although incapable of multiplication under the ordinary conditions of nature outside of the body, may preserve their vitality for a long period in the ground, on account of their resistant character; and, furthermore, that the pyogenic cocci, on account of their considerably resistant nature and their modest demands in the way of nutriment, can be preserved and sometimes probably grow in the ground.

The conclusion which we may draw from the observations mentioned is that, in general, the soil is not a good breeding place for most of the infectious bacteria with which we are acquainted, but that it can retain for a long time with unimpaired vitality those which produce spores or which offer considerable resistance to injurious agencies, such as anthrax bacilli, tubercle bacilli and the pyogenic cocci.

#### HOW INFECTIONS ARE INTRODUCED INTO THE BODY.

In order to become infected with bacteria in or on the ground, these bacteria must in some way be introduced into the body. So various and intricate are the

possibilities for this transportation that it is hopeless to attempt to specify them.

There occurs to us first the possibility of the conveyance of infectious micro-organisms from the soil by means of currents of air. Here I repeat that the wind can remove bacteria from the ground only when the surface is dry and yields dust particles.

Manifold are the ways in which we may be brought into contact with infectious bacteria in the ground, either directly, or indirectly by means of vegetables to which particles of earth are attached, by the intervention of domestic animals, by the medium of flies or other insects, and in a variety of other apparent ways.

An important, doubtless for some diseases the most important, medium of transportation of bacteria from an infected soil is the water which we drink or use for domestic purposes. From what has been said, it is evidently not the sub-soil water which is dangerous, for infectious like other bacteria cannot generally reach this in a living state, but the danger is from the surface-water and from that which trickles through the upper layers of the ground, as well as from that which escapes from defective drains, gutters, cess-pools, privy vaults, and wrongly constructed sewers, or improper disposal of sewage.

Before leaving the subject of the ground as a source of infection, permit me to indicate briefly some conclusions which may be drawn from what has been said as to the principles which should guide us in preventing infection directly or indirectly from the ground.

*First* in importance is to keep infectious substances as far as possible from the ground. This implies the early disinfection or destruction of such substances as typhoid and cholera excreta and tuberculous sputum.

*Second.* The ground should be rendered as far as practicable unsuitable for the continued existence of infectious germs. This, at least for some diseases, is accomplished by a proper system of drainage, which, moreover, for other reasons possesses hygienic importance.

*Third.* Means should be provided to prevent waste products from getting into the

ground around human habitations or from gaining access to water used for drinking or domestic purposes. . . . .

Finally, in cities, good pavements, absence of unnecessary disturbance of the soil, cleanliness of the streets, and laying of dust by sprinkling, are not only conducive to comfort but are sometimes hygienically important in preventing infection from the ground and dust.

#### FOOD AS A SOURCE OF INFECTION.

When we consider in how large a degree the certainty and the severity of infection with many kinds of pathogenic micro-organisms depend upon the number of such organisms received into the body, we can appreciate that the danger of infection from food which contains a mass of growing pathogenic bacteria may be much greater than that resulting from the reception of infected water or air, media in which infectious organisms are rarely present in other than a very dilute condition. The entrance into the body of a single infectious bacterium with the inspired air is, at least in the case of many diseases, not likely to cause infection; but let this bacterium fall upon some article of food, as for instance upon milk, where it can multiply in a short time at a favorable temperature many thousandfold, and evidently the chances of infection become vastly increased.

Among the various agencies by which infectious organisms may gain access to the food may be mentioned the deposition of dust conveyed by the air, earth adhering to vegetables, water used in mixing with or in the preparation of food, in cleansing dishes, cloths, etc., and contact in manifold other ways with infected substances.

Fortunately, a very large part of our food is sterilized in the process of cooking shortly before it is partaken, so that the danger of infection from this source is greatly diminished and comes into consideration only for uncooked or partly cooked food and for food which, although it may have been thoroughly sterilized by heat, is allowed to stand considerable time before it is used. Milk, in consequence

of its extensive employment in an unsterilized state and of the excellent nutritive conditions which it presents to many pathogenic bacteria, should be emphasized as especially liable to convey certain kinds of infection—a fact supported not less by bacteriological than by clinical observations. . . . .

Upon solid articles of food bacteria may multiply in separate colonies, so that it may readily happen that only one or two of those who partake of the food eat the infected part, whereas with infected liquids, such as milk, the infection is more likely to be transmitted to a larger number of those who are exposed.

In another important particular the food differs from the other sources of infection which we have considered. Not only the growth of infectious bacteria, but also that of bacteria incapable of multiplication within the body might give rise in milk and other kinds of food to various ptomaines, products of fermentation, and other injurious substances which when ingested are likely to cause more or less intoxication, or to render the alimentary tract more susceptible to the invasion and multiplication of genuinely infectious organisms. . . . .

I have thus far spoken only of the secondary infection of food by pathogenic micro-organisms, but, as is well known, the substances used for food may be primarily infected.

Chief in importance in this latter category are the various entozoa and other parasites which infest animals slaughtered for food. The dangers to mankind resulting from the diseases of animals form a separate theme which would require more time and space than this address affords for their proper consideration.

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NEVER stand still in cold weather after having taken exercise and become warmed; and always avoid standing on ice or snow, or where exposed to cold wind.

WHEN going from a warm atmosphere into a cold one keep the mouth closed, so that the air may be warmed by its passage through the nose before it reaches the lungs.

## TUBERCULOUS MILK AND MEAT AND CONSUMPTION IN MANKIND.

SYNOPSIS OF A PAPER READ AT THE JULY ANNUAL MEETING OF THE SANITARY ASSOCIATION OF SCOTLAND, BY J. MCFADYEAN, M.B., B.S.C., F.R.S.E., &C., DEMONSTRATOR OF PATHOLOGY IN THE ROYAL VETERINARY COLLEGE, EDINBURGH.

THESE is not any one, Professor McFadyean thought, either in Scotland or abroad, whose opinion upon the point carries any weight, who does not now admit the complete identity of the diseases termed tuberculosis in human and in veterinary pathology. "They are identical in the sense that the cause of the disease in each species is the same—viz., a minute vegetable parasite termed the bacillus tuberculosis, or, as a well merited tribute to its discoverer, Koch's bacillus." Koch showed that the morphological and biological characters of the bacillus cultivated in a state of purity from the diseased products of man, were identical with those of the bacillus obtained from the tubercular lesions of the lower species, that invariably when such pure cultures were inoculated into susceptible animals such as guinea pigs and rabbits, tuberculosis was produced, and that the resulting lesions were the same whether the culture had been started from human or from animal sources.

A tuberculous patient, whether a man or one of the lower species, is to be regarded, speaking figuratively, as a sort of accidental hothouse for the propagation of the tubercle bacillus. There is reason to believe that outside of the animal body the utmost that the bacilli ever do in a state of nature is to conserve their vitality. At temperatures below 86° F. the tubercle bacillus does not grow or multiply even when kept on the most suitable materials. Within the animal body the bacillus grows and multiplies more or less rapidly, exciting, where it propagates, the tubercles and other deviations from the normal structure that constitute the lesions of the disease. We can generally demonstrate the presence of the bacilli in these morbid parts, frequently in inconceivable numbers; and even when our present microscopic methods fail to bring the germs into view, we can still prove that

they are present (probably in the form of spores), by showing that materials taken from the tuberculous organs or tissues are capable of exciting tuberculosis when introduced by inoculation or otherwise into the bodies of susceptible species.

But not only are the germs of tuberculosis thus cultivated in the diseased parts of a tuberculous patient; they are passed out of the body of such an animal while it is still alive, being frequently found in one or other of the natural secretions, such as that of the air passages, the urine, fæces, or milk. Tuberculous men and animals are thus constantly contaminating the earth's surface with the specific bacilli, where, there is reason to believe, the spores, if not the bacilli, may conserve their vitality and power of infection for considerable periods. Consumptive human beings are probably a far more active source of dissemination of the bacilli in this way than any of the lower species: (1), on account of the great number of human beings attacked, and (2) because destructive lung disease, with abundant bacilli in the sputum, is vastly more common in man than in animals. And, in passing, it may be observed that to impress upon phthisical patients and their relatives the great importance of taking precautions against the wholesale dissemination of the germ in the sputum is a duty too often neglected by medical attendants.

A tuberculous animal, then, while it is still alive, and apart altogether from the consumption of its milk or flesh, adds to the risk of infection which every human being runs, and we have here one of the reasons for putting an end to the life of every animal that is known to be the subject of tuberculosis. But the chief interest of animal tuberculosis to human sanitarians unquestionably lies in the fact that the milk and flesh of one of the lower species frequently attacked constitute common articles of human food.

Tubercular disease of the cow's udder is fortunately not a common lesion, but unfortunately it is not rare. Anyone with a knowledge of the clinical characters of the disease will find instances of it in the dairy stock in any of our large towns. It is not a thing of great importance from the cow-keeper's point of view. Professor McFadyean did not suppose that there was a dairyman in the country who, to his knowledge, had ever seen a case. It runs a comparatively painless course, and it does not materially interfere with the general health of the cow. The owner of the animal would class it along with every other variety of mammary inflammation as a case of "weed," and he would ridicule the notion that it rendered the milk dangerous. Nevertheless, it may be asserted, that in every case of mammary tuberculosis the milk contains the specific bacilli. He would not stop to prove that such milk is likely to be the cause of human tuberculosis. There are some who deny or belittle the danger of consuming the flesh of tuberculous animals, but there is no loop-hole of escape from the conclusion that milk drawn from a tubercular udder must be extremely dangerous to human beings drinking it in the raw state.

It may be admitted that we can point to but very few cases in which human consumption had its starting point in the drinking of milk from a tubercular cow. But we know that, given a case of mammary tuberculosis, we can excite tuberculosis in a considerable proportion of individuals, of species not more susceptible to infection than human beings, by causing them to ingest the raw milk from the diseased udder.

But, unfortunately, the whole extent of the danger of milk from tuberculous cows has not yet been set forth. What had been just said applied to cases in which the udder itself was the seat of disease. But it is in only a small proportion of tuberculous cows that the udder is diseased, and until the contrary had been shown there was reason to hope that the milk was innocuous as long as the mammary gland was not the seat of an actual tubercular process. It is matter for regret that recent experiments by very reliable investigators point to the conclusion that even when the udder presents during life and after death no discoverable sign of disease, the milk of tuberculous cows may be in-

fective. It is true that in these cases the bacilli were never abundant, but still the milk contained them in such numbers that a small quantity of it when introduced into the peritoneal cavity sufficed to excite tuberculosis in guinea-pigs.

No one dare assert that even a single bacillus might not set up a fatal tuberculosis when ingested by an infant or an adult with the tuberculous predisposition. In the present state of our knowledge we are warranted in declaring that the milk of a tuberculous cow, even when the udder presents no sign of disease, is unsafe for human consumption, and that its sale ought to be prohibited. Nothing short of an organised system of veterinary inspection of our dairy stocks can guard against this danger. Such inspection would require to be not less frequent than once a month.

Tuberculous meat is a term used in two different senses. It is sometimes employed when organs or tissues actually and visibly tubercular are referred to; at other times it is used in speaking of the apparently healthy carcass of an animal, one or more of whose organs has been the seat of visible tubercular lesions.

The question now at issue among sanitarians is not whether actually tuberculous organs or parts are fit for human food, but whether any part of an animal in which tubercular disease exists at the time of slaughter may, without danger to life and health, be consumed by human beings. On the other hand, we have the advocates of "total seizure," who maintain that tuberculosis is a disease *totius substantiæ*, that whenever there is a single tubercular focus in an animal the bacilli are or may be distributed throughout its entire system, and that consequently every animal in which tuberculosis exists, no matter how limited the apparent lesions at the time of slaughter, ought to be totally condemned as unfit for the food of man. On the other hand, we have those who hold that, in a great many cases of tuberculosis, where the discoverable structural alterations are confined to a single organ and its lymphatic glands, we may with perfect safety assume that the bacilli have not invaded the entire system, and that in such cases the carcasses may without appreciable risk be used for human consumption.

To discuss fully and critically these two

opposing views would involve reference to pathological details which it would be somewhat out of place for him, the speaker, to raise there. He would briefly state his own opinion regarding this point: "In a strictly local tuberculosis there is a risk that a few bacilli may be distributed throughout the body." That, he thought, was a fair statement of the danger attending the consumption of the carcass in strictly local tuberculosis.

The principle of "partial seizure" is that applied in France and in Germany. Under a decree passed in France last year, it is ordained that "the flesh of tuberculous animals shall be excluded from

consumption:" (1) if the lesions are generalised, that is to say, not confined exclusively to the visceral organs and their lymphatic glands; (2) if the lesions although localised have invaded the greater part of an organ, or are manifested by an eruption on the walls of the chest, or of the abdominal cavity. In Germany the practice is substantially the same.

The Departmental Committee, which took evidence in Scotland last year, reported in favour of "total seizure," and the congress of medical men and veterinary surgeons, held at Paris almost exactly twelve months ago, were almost unanimously of the same opinion.

### THE ONTARIO HEALTH OFFICERS MEETING.

THE Annual meeting of the Association of Executive Health Officers of Ontario was held this year in Brockville, on July 20th and 21st. The President, Dr. Burrows, of Lindsay, presiding. There was a good attendance of members, and from all parts of the province.

Mr. Willis Chipman, C. E., read the first paper, on "The Separate System of Sewerage;" and as more than one gentleman at the meeting asked the Editor the meaning of the separate system, we give extracts from this paper which will explain it. After dealing with the matter from a theoretical standpoint, Mr. Chipman made a diagram showing an ideal arrangement of pipes and conduits for supplying water and removing sewage in a city. Water supply and sewerage were inseparable, and a city with one and without the other could not remain healthy. By the separate system he said is meant a system in which the rain fall is excluded from the sewers that convey the house sewage. Its advantages and disadvantages have been discussed by engineers and sanitarians for several years. This year some of the most distinguished engineers in America and in England had contributed important information on this matter. From a careful reading of all that had been written he was convinced that those who have written the most and the strongest against the separate system are those who have not made themselves fully acquainted with it.

The advantages of the separate sys-

tem are: 1. The quantity of sewerage to deal with is a comparatively fixed quantity, not varying from 1 to 60 as in the combined system; 2. The quantity being small, sewers can generally be made of salt glazed sewer pipes impervious to liquids and gases under ordinary working pressures, which offer a smoother surface than any brick or cement surface; 3. The sewers are regularly and thoroughly flushed by automatic flush tanks with pure water, while in the combined system the rain fall is supposed to do the flushing; 4. The sewers have no connection with cellars of buildings, the cellar and sub-soil water being removed by separate conduits from the house sewage pipes.

The separate system is especially applicable when the storm water can be removed by surface gutters, when it is necessary to carry the sewage a great distance, and where it is either now necessary or will become necessary to treat the sewage whether by sub-surface irrigation, broad irrigation, downward intermittent filtration or by chemical precipitation or clarification. Mr. Chipman then gave a description of the Brockville sewer system. It is designed to convey, (1) liquid house wastes, (2) excreta, (3) a limited amount of roof water, (4) subsoil water, and (5) cellar water. The main sewers and laterals consist of vitrified salt-glazed sewer-pipe, called "sewers," designed to carry the liquid house wastes, excreta and roof water. Alongside the "sewers," are laid agricul-

tural drain tiles, designed to carry the subsoil water and cellar water. This system is not designed to carry street water, garbage, ashes, vegetable parings or rubbish.

In Brockville they had great difficulties in the construction of the works. The outfall is located over 900 feet out from the shore of the river. The line of the main sewer passes under a railway tunnel and in many of the sewers rock excavation had been heavy. Notwithstanding these difficulties there were no sections of the system but that it was possible to see through from manhole to manhole or to lamphole as the case might be, showing a degree of accuracy in construction that is seldom attained even where the excavation is in earth. The flush tanks give good satisfaction, the difference between the sewer air in those sewers in which flush tanks are in operation and those in which they are not yet in operation being very marked.

A lengthy discussion followed. Dr. Griffin, of Brantford, said in that city they had in use the dry earth closet system, but were about to abandon it for the separate system. Ald. Taylor, of London, spoke on the questions and criticized sharply the method introduced at London. An adjournment was then made and the members of the Association made a tour of inspection of the Brockville sewer system.

A paper on the Prevention of Carbonic Oxide Poisoning from stoves was read by D. Cassidy of Toronto. Dr. Rae, of Oshawa, Chairman of the Provincial Board of Health, said he had made a good many observations, and experiments in reference to this subject and strongly condemned the use of a damper in the pipe. With a free draft in the pipe and a moderate fire, not too free vented below, the minimum of carbonic oxide was given out. An opening in the side of the pipe as a means of ventilating rooms did not interfere with the draft. Dr. McFarlane, chief Dominion Analyst, also made some practical remarks.

A paper on "Methods of and Facilities for Investigation of Causes of Disease in Ontario," was read by Dr. H. P. Yeomans, of Mount Forest, member of the Provincial Board of Health. He proposed a Hygienic Laboratory under the Provincial Board of Health, where training might be given to those wishing to study the methods of investigation of the causes of disease.

A paper on Sanitary Regulations and Legislation was read by Dr. Playter, editor of this JOURNAL, by special request. In it an appeal was especially made for the education of the public in health subjects, and with this view, chiefly, a Dominion Health Department was advocated. This should collect mortal and vital statistics and health reports, and publish a Bulletin monthly, fortnightly or weekly; look after and investigate special outbreaks of disease in man or domestic animals; use measures for preventing the adulteration of foods; and co-operate with provincial boards; besides looking after the outside sanitary service—quarantines and epidemics, and the departure of ships from ports in other countries.

The two last named papers created a good deal of discussion, inasmuch as it was also proposed to establish a hygienic Laboratory in connection with the proposed Federal Health Department. The latter, however, it was contended, should be a very perfect institution for the investigation of special causes and outbreaks of disease. Alone it would require the expenditure of a large amount of money, but could be economically added to the department of the chief analyst, and one such would be sufficient for the Dominion. There was, of course, no objection to any province also providing for a hygienic laboratory for educational purposes if it so desired.

Later in the conference a resolution was passed, unanimously in a full meeting, expressing approval of the establishment of a Dominion Department of Health, as proposed at the last session of Parliament by Dr. Roome, M.P., and a hope that the Federal Government might be induced to take action in this behalf.

The Chief Dominion Analyst, Dr. McFarlane, gave a very interesting explanation of the new process of milk analysis, and pointed out the ease with which all health officers might become experts at it. Dr. Moore, of Brockville, read a practicable paper on the Sanitary duties of the Surgeon. A resolution was passed recognizing with pleasure the importance of the service rendered by the Department of Inland Revenue, through Mr. McFarlane, in the cause of health. One was also passed favoring the establishment of a laboratory in connection with the Provincial

Board of Health. Dr. Griffin of Brantford, was elected president for the coming year.

In the evening a "citizens' meeting" was held in the Opera House, which should be productive of good to the citizens of Brockville. The house was filled with a most respectable audience, consisting largely of ladies. It was a good idea to intersperse, as was done in this case, useful addresses on health, so unfortunately regarded by most people a "dry" subject, with music, songs and recitations. The entertainment lasted over three hours and the purely entertaining part was on the whole excellent, while two or three parts, especially those by Miss Smart and Miss Baniff, were highly admirable, and displayed much talent and culture.

Here the president read a good and suggestive "annual address"; Dr. Bryce addressed the meeting on the Dangers of our School Children; and Dr. Hewitt, of the Minnesota Board of Health, gave a pleasing and clever speech.

Judge Reynolds closed the meeting with some pertinent remarks on the "Legal Rights of Citizens to Sanitary Protection," in which he referred to some sanitary

needs in some of the streets of the town, which were far from clean. In the province, Judge Reynolds said, we have a health act which prescribes the rules to be observed with regard to traps and drains, but so far the law is "much more honored in the breach than in the observance." The profession of architect, he said, should be raised to such a standard that no person should be allowed to style himself architect, much less to practice as one, who had not passed a satisfactory "course" on sanitary science. And the trade or business of plumbing should not be permitted to be carried on by any save those who had passed an examination before a qualified board of examiners.

Brockville is beautifully situated on high ground and should be a healthy place. She has not included herself in the list of towns which made returns of mortuary statistics, hence we do not know her rate of mortality. She is in need of a "first class" or good hotel.

The health officers were entertained to an excursion among the Thousand Islands in the afternoon and to a dinner in the evening at the principal hotel,

#### MISCELLANEOUS NOTES AND EXTRACTS.

ON THE THREE VARIETIES OR GROUPS OF INFECTIOUS DISEASE.—It has always been recognized that some infectious diseases, such as the exanthematous fevers, are conveyed directly from the sick to the healthy. It is not disputed that in these evidently contagious diseases the infectious germ is discharged from the body in a state capable at once of giving rise to infection. In a second group of infectious diseases, of which malaria is the type, the infected individual neither transmits the disease to another person, nor, so far as we know, is capable of infecting a locality. Here there is reason to believe that the infectious germ is not thrown off in a living state from the body, but is destroyed within the body. In this group the origin of infection under natural conditions is always outside of the body. In a third group there is still dispute whether the disease can be transmitted directly from person to person, but all are agreed that the infected individual can infect a locality. It is especially fortunate that the bacteria which cause cholera and typhoid-fever, the two most important representatives of this group of so-called miasmatic-contagious diseases, have been discovered and isolated in pure

culture. These are the diseases about whose origin and epidemic extension there has been the greatest controversy.—Prof. W. H. Welch, of Johns Hopkins Univ., Balt. Ind.

WASH AND GROW FAT.—Sir Edwin Chadwick, at the recent health congress and exhibit at Hastings, Eng., said, one inducement for coming, besides reading his own paper on the "Death-rate and the Census." was to see the opening of what he considered a great sanitary factor—the power of washing cheaply with tepid water. The German army was the lowest death-rated of any in Europe, being only five in a thousand, while our army was eight, France ten, and Italy eleven. One means of this was the factor of washing with tepid water. That he had shown in England was the great means of reduction of the children's diseases in the district schools. In Germany half a million of soldiers were being washed with tepid water at the cost of about 6d. a hundred, soap included. He expected that when the exhibition opened he would be able to display a power of washing children with tepid water at the rate of a working expense of not above 1d. for a dozen, and they would accomplish it

at the rate of a little more than three minutes for each child. He had long shown elsewhere that pigs that were washed put on one-fifth more flesh than the pigs that were unwashed, and more than this was the result with children.

**TOBACCO EFFECTS ON THE YOUNG.**—In an experimental observation of thirty-eight boys of all classes of society and of average health, who had been using tobacco for periods ranging from two months to two years, twenty-seven showed severe injury to the constitution and insufficient growth; thirty-two showed the existence of irregularities of the heart's action, disordered stomach, cough, and a craving for alcohol, thirteen had intermittency of the pulse, and one had consumption. After they abandoned the use of tobacco, within six months one half were free from all their former symptoms, and the remainder had recovered by the end of the year.

**ESSENTIALS OF THE MOTHER.**—Calmness and equanimity are what young women most frequently lack, says Donne. Cazeaux says;—So essential a condition is this, that I take into deep consideration the nervous condition of the mother when judging of the propriety of her nursing; and, if she is too excitable, I prefer intrusting the child to a wet nurse. A mother whom the least cry of her child fills with anxiety, or who cannot see it fretful or in pain without being overcome, will hardly fail to make a bad nurse. A child is rarely brought up without suffering some derangement or other of its health, and, sometimes, even serious disease. It is precisely on such occasions most important to have milk perfectly pure, which it never can be from the breast of a mother who will not, or cannot, control her emotions.

**A VENTILATING DADO.**—At a recent meeting of the Glasgow Philosophical Society, the subject of house ventilation was brought up by Mr. D. G. Hoey, who said that he was a disciple and follower of Sir Humphrey Davy, and that the method he had elaborated was founded on Davy's work. A dado of three to four feet in height was placed round the walls of the apartment, with a narrow space between the dado and the wall to form a reservoir for fresh air let in from without by inlets in the wall. On the top of the dado wire

gauze or perforated metal was placed, through which the air percolated into the room. The area of the exit from the top of the dado being much greater than that of the inlet, and the total space enclosed by the dado being much greater still, the fresh air passing through this extended space lost its initial velocity, and percolated gently into the room. The total area of the inlet was proportioned to that of the hot-air shaft for carrying out the impure air. The needful column of hot air, for carrying off the impure exhausted air, could best be supplied by a chimney of suitable capacity, with a close-throated firegrate, having an opening in the room at a high level into the flue. When a suitable chimney was not available, the same results were produced by a tube of sufficient area and height erected above a sunlight in the roof of the hall.

**SPIRIT AND OBJECT OF MANUAL TRAINING.**—The production of thoughtful, self-relying, honest men. It is believed that the specific purpose of education is to cultivate character, to induce sound thinking, and to make a necessity of scientific inquiry. Its highest end is ethical. Of great value, but secondary to its supreme purpose, are the skill and the information which would be the natural result of such cultivation. The aim of the school is to prepare for completeness of life. The central thought in its entire organization is always the boy himself, and everything that is done, every study that is taken up, every influence that is brought to bear, has for its sole purpose his development. In this view of its proper function, the school is a purely educational institution, and is industrial only in making use of the tools of industry to accomplish its chosen purpose. The manual work, like the work in science and literature, is simply a means of development. It bears the same relation to the process of education that a railway train does to travel. One may select slower modes of approach if he chose, but, in his delight at the rapid transit, he must not confuse the journey with the end for which the journey is made. Those who hold this view of manual training, watch with sincere regret any encroachment of that spirit which places the inanimate product, however ingenious and beautiful it may be, above the human product. The object of manual training, they believe, is the production of thoughtful self-reliant, honest men.—Prof. C. H. Henderson, in *Popular Science Monthly* for August.

**TOBACCO AND THE KIDNEYS.**—Dr. Auld, an eminent physician of Glasgow, calls attention, in a recent number of the London Lancet, to an important fact which seems to have been heretofore overlooked: viz., that tobacco may be a cause of organic disease of the kidneys. As it is well known, the appearance of albumen in the urine is the leading symptom of Bright's disease of the kidneys. Dr. Auld finds that the use of tobacco is often accompanied by this symptom, and lays it down as one of the results of chronic nicotine poisoning. According to his observations, tobacco is responsible for a very large number of functional disorders not commonly attributed to it. Tobacco poisons both the nerve centers and the nerve ends, causing muscular twitching and various other nervous symptoms. When these symptoms are present, it is not sufficient merely to moderate the use of the drug, but it must be wholly discarded, otherwise a cure cannot be effected.

**A FEW OF THE EVILS OF TOBACCO.**—Good Health, gives the following, with which this Journal is in full accord: The amount of nerve energy and vital force that is being squandered by the use of this drug, is beyond estimate. If the sum total of human life and strength sacrificed to tobacco could be represented in figures, the aggregate would be astounding. Tobacco is unquestionably one of the worst of all the curses of civilization. The mischief done by opium, cocaine, and other vice-drugs is enormous, but insignificant beside the far-reaching evils justly attributable to the use of tobacco. Thousands of men are kept in a state of chronic lethargy by its narcotic influence. Millions of consciences are benumbed by its subtle spell. Countless multitudes of children are born with weak nerves and feeble constitutions, as the result of the chronic nicotine poisoning of parents. The use of the vile drug by civilized man is one of the enigmas of modern civilization. The old Greeks and Romans who shaped the foundations of our modern civilization, used neither tobacco, tea, nor coffee, nor strong liquor. Unless a radical change for the better can be effected within a few generations to come, the condition of the then existing race, at the present rate of deterioration, is fearful to contemplate. Extinction would come at last as a beneficent act of Nature, who desires only the survival of the fittest.

**ON THE VALUE OF HEALTH.**—It is a good thing to accumulate pithy sayings by eminent men. In a recent address by Prof. Tyndall, he quotes two valuable paragraphs which may at any time afford useful texts to medical men who have to preach on this subject: "There have been men who by wise attention to this point might have risen to eminence, might have made great discoveries, written great poems, commanded armies, or ruled States, but who by unwise neglect of this point have come to nothing. Imagine Hercules as an oarsman in a rotten boat, what can he do there but by the very force of his stroke expedite the ruin of his craft?" Health is a priceless boon. When once we are in possession of it no effort or care should be spared in its preservation. When lost it may never be regained. In one of Mr. Emerson's essays, he says: "Get health. No labour, temperance, pains, poverty, nor exercise that can gain it must be grudged, for sickness is a cannibal which eats up all the life and youth it can lay hold of, and absorbs its own sons and daughters.

**MORAL EFFECTS OF TOBACCO.**—Dr. J. M. W. Kitchen, in the N. Y. Medical Record, gives the following, which we fully endorse: Tobacco injures health through its moral effects. The tobacco habit is certainly a dirty, and frequently a disgusting habit, and encourages other dirty practices. Its use tends to make men cowardly, irritable in temper, and low in spirits. It blunts ideas of purity and courtesy, leading to invasion of the rights of others. Thousands whose systems are saturated with nicotine and who reek with nauseating odor do not hesitate to inflict their presence on sick or well. The time will come when the tobacco-user will not be allowed to poison the atmosphere that is the common property of the public—will not be allowed to force the inhalation of nicotine upon the general public, to say nothing of being allowed to poison the infants and women in his own family. What would be said of a man who introduced poison in any degree into the food or drink of his child? Is the poisoning of the household atmosphere by the ignorant, thoughtless, or selfish smoker morally more defensible.

STAMPING OUT CONSUMPTION.—The Canada Medical Record says: We venture to say that were it possible to isolate every case and disinfect every house, that the next generation would see the disease stamped out. These may be considered advanced views, but they are every year becoming more and more generally received, and we believe that the prevalence of the disease will gradually diminish just in proportion as these views are accepted by the profession at large. We know personally of many cases in which there was absolutely no heredity, but a very strong contagious element, while on the other hand we know of no case where there has been heredity without exposure to contagion either from the parents or from the house in which the case occurred.

ON "WEAK HEARTS," the Scientific American gives the following sensible remarks: The practical evils which are associated with a feeble heart are innumerable, and will readily suggest themselves to those who possess so unsatisfactory a pumping engine. Weak hearts are by no means so common as is often supposed. Many a man who thinks he has got one is merely dyspeptic; many a woman owes her symptoms to tight lacing or insufficient feeding. Even when the heart is genuinely "weak," the weakness is not always due to special disease of that organ. It may be only part of a general weakness, easily curable. The late Sir Robert Christison, one of the most eminent of British physicians, used to smile at certain persons who were always complaining of weak hearts. "Gentlemen," he would say to his students when lecturing on digitalis, "gentlemen, the best tonic for a weak heart is a good, brisk walk." The majority of weak, flabby hearts are weak and flabby because every other muscle in the body is weak and this general weakness and flabbiness is due to want of vigorous use. Exercise of the legs, and back, and arms, gives additional and much needed exercise to the heart, and the heart grows strong by vigorous exercise exactly as every other muscular organ does. If a man has no organic disease of the heart, no enlargement, and no functional disorder, plenty of brisk walking, with occasional running, will soon dispel his breathlessness and heart weakness, other things being equal.

HEREDITARY TENDENCY AND CURE OF CONSUMPTION.—Besides general weakness, a small heart, and attenuated blood vessel walls, the hereditary tendency of consumption consists in the liability to the formation of small, circumscribed characteristic inflammations in the lungs, just as a liability to desquamative, watery, itching skin eruptions is congenital. The inhaled bacillus preferably adheres to and flourishes upon such areas. We also see that arsenic and tar preparations, like creasote, act most favorably in phthisis, as they do in skin eruptions. It is the nutritive soil of the bacillus that must be acted upon in order to attain results. Phthisis is cured, therefore, not by the annihilation of the bacilli, but by giving support to the cellular elements performed for that purpose.

A DIFFICULTY IN SANITARY PROGRESS.—Dr. Garrison, Health Officer of Wheeling, Vir., remarks: One thing that weakens the public estimation of the importance of sanitary safeguards, is that nobody can prove that a preventive prevents. So long as the stable is locked, it is impossible to say that it has prevented the horse being stolen. Unlike most things, the usefulness of a preventive is proved only by not using it. The moment it is put in use, the demonstration of its necessity ceases.

ANOTHER DANGER.—The eggs of the *tania echinococci*, a parasite derived from dogs, and, therefore, more or less infecting all waters to which dogs have access, appear to have an unequalled facility of passages to all parts of the human system. The New York Medical Journal quotes from a German publication particulars of a case in which the eye was thrust out of its socket by an *echinococcus* cyst in the rear, discovered by surgical exploration, and extracted.—Pacific Rec. of Med.

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AN EXHIBITION of apparatus for the saving of human life and the prevention of accidents was opened on April 30th at Berlin by the Emperor accompanied by the Empress.

A SUCCESSFUL MOVEMENT has been carried out by the workmen of Sheffield, Eng., which deserves to be both widely known and imitated. The object is to diminish the risk of spreading infectious diseases in the general community by indemnifying the members for any loss of wages they may suffer through abstention from work when dangerous infectious diseases exist in their homes.

## EDITORIAL NOTES.

A MINISTER OF PUBLIC HEALTH the Sanitarians of England are resolved to have. Now the President of the local Government Board there is almost the same thing. In Gladstone's Government this official was given a seat in the cabinet during two parliaments, we believe, although he was not accorded a vote in Council. At nearly all the meetings of Sanitary Societies there, members urge for a complete Department of Health with a Minister, as in the other Departments of State. In the Public Health Section, at the Annual meeting of the British Medical Association last month, Dr. J. Brindley James, M. R. C. S., said: What we need is a civil medical service of the Crown. We have Ministers of Commerce, of Public Works; the Post Office is represented in the Ministry, but no recognition of the sanitary claims of the nation or of the medical profession itself has ever existed officially in England. What is needed to constitute a proper medical administration—not necessarily a complex one—is the creation of two medical peers—one a distinguished consulting surgeon, the other an eminent physician—and a Cabinet Minister of Public Health—with the prospect of a similar distinction on retiring from his office, appointment thereto being based absolutely on his professional eminence and abilities alone; in no way on his political sympathies.

IN FRANCE, as a few months ago we noted they have now virtually a department and Minister of Health—the “Director of the Health service.” Hence England cannot now take precedence in this regard, although she might make provision for a somewhat more complete organization than they have in France, where another service—the “Assistance Publique,” is still associated with that of public health. In the United States, too, strong efforts are being put forth to secure a department of health in connection with the Federal Government. Why should not Canada take the lead in this, and next session adopt through her representatives in Parliament, the course which will be proposed by Dr. Roome M. P. It would undoubtedly do the Dominion much good in the estimation of other countries (for sanitary progress is now being very generally appreciated and recognized) while no other appropriation parliament could make would yield so good and valuable a return to the Canadian people.

THE UNITED STATES Government has recently inaugurated a sanitary movement of great importance and one that it is earnestly to be hoped will be pushed to realization. The Department of State has addressed a communication to all the European Governments asking their co-operation in measures to prevent the spread of infectious diseases. The proposal is made that well known plagues centers, liable from their commercial relations with the world to diffuse the germs of cholera, yellow fever and similar pests, shall be declared obnoxious to humanity, and the government in whose territory they are situated shall be called upon to cleanse them to the satisfaction of an international commission appointed to regularly inspect them. Lord Salisbury it appears says that England will do everything in her power for the furtherance of such an object, in which she is especially interested. Semi-civilized countries may not take kindly to this scheme, but in that case, as an Exchange gives it, the strongest kind of *suasion* might be brought to bear upon them by those nations endowed with common sense.

THE INLAND REVENUE DEPARTMENT of Canada has done the country a good service by enlightening the public in relation to baking powders; to say nothing about previous like valuable services in reference to milk, infants' foods, &c. The practical service would have been perhaps greater and it would have been a guide to the public and at the same time but fair to the makers of powders classed as safest and best, to have given clearly and definitely the names of the various brands subjected to analysis. Unless the public are willing to be slowly poisoned, it is absolutely essential that they give more attention to the composition of the baking powders used.

THE BEST, THE SAFEST—The “Ideal baking powder,” the report states, is a mixture of good cream of tartar with proper proportion of bicarbonate of soda, and about 15 to 20 per cent of pure starch. “Not only was this mixture in popular use before the prepared mixture was in the market, but many persons now make the mixture for themselves instead of trusting to the baking powders offered for sale by grocers.” In the family of the editor of this JOURNAL, we may bear witness, they have done this for many years and found it altogether the most

satisfactory way. On a number of occasions we have recommended this composition to our readers and we are very glad indeed to learn that it constitutes the best powder; as it is, too, altogether, by 60 or 70 p. c., the most economical.

OF ALL THE BAKING POWDERS examined, 54 brands, very few were unobjectionable. Indeed 13 only were mainly cream of tartar powders, the only powders which are fit for use, if we regard the health. Five were tartaric acid (with cream of tartar in some cases); 2 cream of tartar with carbonate of ammonia; 4 alum powders; 3 phosphate powders; 26 alum phosphate powders, and one bi-sulphate of potash. Eleven of the brands were from the United States. One was from England. Four of the American samples were cream of tartar powders; one each cream of tartar and carbonate of ammonia, and cream of tartar and tartaric acid; one alum, and two each of phosphate and alum phosphate. The English was an alum powder. Fifty-seven per cent. of the Canadian brands were found to be alum phosphate powders and hence not fit to be taken into the stomach.

IN A LEADING ARTICLE bearing on the analysis of these powders the Monetary Times says:—If, after all, white bread, irrespectively of wholesomeness, is the great desideratum, the buyer will use the flour and the baking powder that assist in accomplishing this end. It has been proved that the refining process of the modern roller mill denudes the flour of one of its most vital components, *i.e.*, potash salts, which are said to lie next the inner bran. The bone and muscle forming flour is not the whitest flour and when a baking powder is added to make a white and light loaf by reason of the bleaching qualities of the alum contained therein, the result may be something nice to look at but decidedly injurious to health. By all means give us the names of the manufacturers whose powders are found to contain the objectionable element and then there can be no excuse for the consumer to act ignorantly in making his selection.

THE PRECISE PROPORTIONS, as given by the Dominion Analyst, for the safest and best baking powder, are as follows: starch 20.0 per cent., bi carbonate of soda 23.7 p. c., and cream of tartar 56.3 p. c. Without some admixture of

a neutral substance, such as starch, a gradual deterioration of the baking powder results from long keeping, due to the slow interaction of the constituents as they become affected by atmospheric moisture. Rice flour or wheat flour, we believe, answers every purpose. Indeed we have always recommended rice flour. A reliable druggist is the best to buy from, who will give the exact proportions, carefully weighed, of the two active ingredients. The proportion of flour or starch is not so important, but should not exceed one-fourth the quantity by weight of the two other ingredients. Always ask for the purest, BEST, cream of tartar, as it is often adulterated with most objectionable compounds. We would again strongly urge our readers to adopt this plan, and this only, of supplying their cooks with baking powder.

THE DANGER of contracting tuberculosis in travelling on ship board with a consumptive patient was recently brought out by a barrister, in the Australian Medical Gazette. Dr. Whittaker, of Cincinnati, at a recent meeting of railway surgeons, has shown a like danger in sleeping cars. Although we have frequently been all night on board a train, we have not now for several years taken a birth in a sleeping car, on account of such a danger, and from the absolute lack of any means of proper ventilation in these curtained cells; preferring to occupy a seat in a better ventilated, even if still very badly ventilated, parlor or other day car. No more disgraceful and disgusting condition exists in society which has the means to provide better, than this one of foul air in the "palace" sleeping car, to say nothing of its danger.

IT WOULD be difficult to conceive of a conjunction of circumstances; Dr. Whittaker says, more directly contributive to disseminate this disease than is offered in the palace car. It is always badly ventilated, the vestibule car especially, close and hot with sixteen to thirty people in a space that might make a small hall in a house, but never a bedroom for a pair of human beings. Somebody is always hurt by a draught, so that windows are kept closed. With the gathering shades of the evening, the compartments containing the bedding are opened into the car to diffuse through it a disagreeable musty odor. The traveller is treated to the visible luxury of clean sheets and pillow-cases, but the blankets, mattresses, carpets, and worst of all,

the curtains, remain the same until worn out. Consider now that every car contains or has recently been occupied by a consumptive traveller, and there be deposited upon bedding, curtains, etc., tuberculous matter. What becomes of it? The car may also have been recently occupied by a person only recently convalescent after smallpox or scarletina, or by one suffering from primary syphilis.

THE REMEDY suggested is as follows: The plush velvet and silk hangings must go. Seats should be covered with smooth leather that they may be washed off, carpets substituted by rags, to be shaken in the open air at the end of every trip, or better still, abolished for hard wood floors. The curtain abomination must give place to screens of wood or leather; blankets of invalid's beds subjected to steam at a high temperature; mattresses covered with oiled silk or rubber cloth, that may be washed off; and above all things, invalids provided with separate compartments, shut off from the rest of the car, with the same care that is taken to shut out the smoke of tobacco. Dr. Whittaker did not mention better general ventilation of the car, perhaps thinking it too much to expect of a railway company. This, good ventilation, we think of the first importance.

FOR INTEMPERANCE we believe there is no better direct remedy than strict "vegetarianism." Since the time when Sir Charles Napier, F. G. S. read a paper on the subject before the British Association at Bristol, England, a great deal of evidence has been advanced in favor of this remedy. The experiments of Sir Charles were based on the theory of Liebig, that the use of alcoholic liquors could not be indulged by those who confined themselves to farinaceous food. Sir Charles tried a vegetable diet as a cure for intemperance in twenty-seven cases, and the cure was effected in every case, the time varying from 36 days to 12 months.

FURTHER EVIDENCE is now given in one of the "Penny Papers" published by the National Temperance Society and Publication House, New York. The experience of a physician is given, who states that he inherited a good constitution but wrecked health and happiness by bad habits early in life. He commenced to chew and smoke tobacco, thinking there was no harm in it because preachers visiting at his father's house used tobacco. The tobacco habit led to

indulgence in intoxicating liquors. He struggled against the growing habit but to no purpose. His life was a struggle against an appetite which usually came off victorious, leaving himself the defeated victim. After much suffering and many broken resolutions he determined, if it were possible, to eradicate the appetite. For this purpose he studied and experimented on various methods pursued at Inebriate Asylums but failed in every experiment. At length he was induced to try the experiment of a vegetarian diet.

HIS EXPERIENCE: "My health is greatly improved, and the old craving for tobacco and stimulants has been entirely obliterated. Tobacco and alcohol had made me almost a complete physical wreck; my nerves were so shattered that my hands were as tremulous as a palsied man's; indigestion and palpitation of the heart were common; while I suffered intensely at times from rheumatism, neuralgia, and such obstinate and painful constipation that I had to take my medicine as regularly as my meals. Under the new habits and diet, I was soon enabled to lay aside medicine entirely, and I have not taken a dose for more than five years. My nerves are steady, my mind is clearer and more vigorous, so that I can do twice the amount of work with half the labor. Six months after adopting the vegetarian diet, I missed the rheumatism. It has never returned. I am fleshier than ever before; I have a splendid appetite; eat all kinds of vegetables, fruits, nearly everything but meat, though I use sweet things very sparingly; pickles, pepper sauce, mustard, and all such innutritious, irritating substances I avoid.

A MOST SUGGESTIVE case, with the result of which we are in full accord, is brought to mind by the reference to "tobacco smoke" and "tobacco habit." A man was recently brought before a police justice of Chicago for thrashing a fellow-passenger on a street car. The man who was pommelled was smoking. He was requested to stop. He did not, and was thrashed. The verdict of the justice was: "The public has rights. The prisoner did perfectly right, and is discharged." The editorial comment of one of the dailies, was as follows: It is therefore settled, so far as a police court decision can settle anything, that a man who

persists in smoking on a car where there is a woman may be thrashed by her escort, if he is strong enough, and can expect no redress. This kind of law may shock the Supreme Court, but there is considerable horse sense in it. No man has a right to make a nuisance of himself in a public conveyance.

THE same reason prevails why a man should not make a nuisance of himself on the side walk of a city street by puffing tobacco smoke, even from a cigarette, in the faces of the pedestrians. He has no right to do so; and any such should be pushed off the side walk, and at least made to take to the street, the drive way, with hand carts and cycles. It is simply atrocious that the atmosphere of the most public thoroughfares should be thus fouled, to the great inconvenience, disgust and detriment of the majority of well behaved citizens, by individuals who one might suppose had been taught "better manners." Probably no city on this continent can outdo Ottawa in this regard. The time will come (it is to be hoped it's near) when such a law as was once enforced in Boston will become general, by means of which such ill mannered persons may be forced to contribute by a fine to the city funds and hence toward keeping the streets clean.

IT IS GRATIFYING to learn from the Medical Record that the falling off in the habit of cigarette smoking, at least in the street and other public places, is becoming very noticeable. Dealers also say that there has been of late a great decrease in the sale of cigarettes.

TO "SEE NAPLES AND DIE" had become a phrase which had a rather fearful as well as literal significance, the Neapolitan fever being the dread of all foreign travelers. But the day of its renovation has about come to the beautiful city of Naples. What Italy does, it does thoroughly, it is said, and it is no ordinary movement which the Government is now making for the complete renovation of the city. It means the demolition of seventeen thousand houses including sixty-two churches in the very heart of the city. It means the expenditure of over forty millions of dollars in one stupendous sanitary work, the cost to be borne mainly by the Italian Government. It will take ten years to complete the work. But the health of Naples once more assured, and the returns even for this large expenditure, will be many fold; while the

impetus thus given to sanitary science will be world-wide in its results. A splendid example for Governments to follow.

A DR. MUNRO, in the London Lancet, according to the American Lancet, Detroit, presents data showing that in the little town of Jarrow, Eng., the system of compulsory notification has been the means of saving, during the last ten years an average of eighty lives and one thousand cases of sickness per year; to such an extent have the people been benefitted.

ORDERS have been given Prussian army surgeons to measure the chests of recruits every four weeks. All are to be regarded as narrow chested the circumference of whose chests is less than half the length of their bodies. Certainly a very reasonable limit; less than life tables give for good development. Narrow chested men whose chest are not widened by drill are to be regarded as predisposed to tuberculosis, and to be discharged as soon as possible lest they infect healthy soldiers.

ATTENTION has been repeatedly drawn to the dangers in the use of small faucets in filters and such vessels, from the liability of the faucets to become foul and, from their construction and size, the difficulty in cleaning them, especially when they are fastened firmly into the vessel with which they are connected. The use of all should be prohibited except such as can be readily scalded and cleaned. Their habitual use for water should be discouraged. A simple sprout although not always so convenient is much safer.

THE American Public Health Association will hold its Seventeenth Annual Meeting at Brooklyn, N. Y., on October 22, 23 24 and 25, 1889. The Executive Committee have selected the following topics for consideration at said meeting: 1. The causes and prevention of infant Mortality. 2. Railway sanitation. (a) Heating and ventilation (b) Water supply, water-closets, etc.. (c) Carrying passengers with communicable diseases. 3. Steamship Sanitation. 4. Methods of Scientific cooking. 5. Yellow fever. 6. The prevention and restriction of tuberculosis in man. 7. Methods of prevention of diphtheria. Compulsory Vaccination, Sanitation of Asylums, Prisons, and Jails. Papers upon other sanitary subjects may be received subject to the requirements of the by-laws, by the secretary, Dr. Irving A Watson, of Concord N. H.

THE Hygienic Uses of the Imagination, was the subject of Sir J. Crichton Browne's Address in Psychology at the last months annual meeting of the British Medical Association, and the Journal says, will be long remembered one of the great features of the meeting. No narrow local habitation in the brain has yet been assigned to this noblest attribute of man, the imagination. "Imagination is the air of mind," and as Napoleon said, "it rules the world." This strange yet simple gift was as nearly localised by Shakespeare as it is ever likely to be when he said its forms and shapes "are begot in the ventricle of memory, nourished in the womb of *pia mater*, and delivered upon the mellowing of occasion." We have progressed no further than that, with all our knowledge.

THE MICROSCOPE and the scalpel teach the doctor so much that the novice looks to his tools to do more for him than they ever can do. "The tendency of his studies," says Sir J. Crichton Browne, "is among the less reflective to encourage a materialistic philosophy, and to give a kind of sanction to the notion that mind is merely brain function." But mind is "not a mere exhalation of brain matter," nor is brain a sort of "solidification of mind." Materialism is a logical error founded on a fundamental blunder; but natural enough, perhaps, in a young man intoxicated with the wonders revealed to him by his first acquaintance with the working of this intricate machine of the most elaborate construction; which however, no more thinks than the eye sees or the ear hears.

WE KNOW how often—and Sir J. Crichton Browne laid great stress on the fact—poverty in mental resource, like general mal-nutrition, actually invites disease. By the cultivation of the imagination the treasures hidden in the intricacies of the brain are laid under contribution, and "a flash of intuitive preception brings them into harmony and combines them by a synthesis which displays an energy more than the sum of the respective forces of the ideas themselves." With this energy we can combat morbid suggestions, distract our minds, and look beyond the moment. To be possessed of it is to have the noblest form of health, a mental wholeness which is the consequence of singling out of our mental acquisitions predestined elements which in combination make the sound mind.

OF THE moral causes of insanity during the ten years 1878-87, domestic trouble, adverse circumstances and mental anxiety are answerable, according to the report of the Lunacy Commissioners, for sending some 27,000 cases into English

asylums. It is an inference warranted by observation that a very large proportion of such cases lose their balance for want of the support which the resources of a well-stored mind un-faillingly afford.

It is the mynd that maketh good or ill,  
That maketh wretch or happie, rich or poore.

ON THE BROWN-SEQUARD injections, a great many competent observers have been experimenting and the conclusion which they have almost unanimously come to is that the injection of a very small quantity of spermatic fluid under the skin, so that it may be absorbed, will act as a prompt and pleasant stimulant. Its effects, however, are only temporary and transitory, and the wild hope that it was the Elixir of Life at last has been dashed to the ground.

BROWN-SEQUARD'S discovery, however, is not without value, for, as the Canada Medical Record says, it teaches the moral that if we would possess the vital fluid in our old age we must not recklessly squander it in our youth. But this has been long known.

TYROTOXICAN, a mischief-maker in milk, according to Prof. Vaughan, does not develop below 60° Fahr., and is anaerobic—grows when air is excluded, so says the Popular Science Monthly. Some very simple measures, then, are preventive: 1. Scrupulous cleanliness. A little dry milk on the rim of a can or vessel may breed the germ which will find a culture-ground in fresh milk: 2. A low temperature—below 60° Fahr. 3. Ventilation in an untainted atmosphere. These precautions are generally observed by careful dairymen and cream manufacturers. There is grave reason to fear, however, that they are not generally observed after the milk reaches the consumer's hands. Also, the slightest carelessness may effect seriously that class of the community which does not speak for itself—the dear little innocents.

VACCINE VIRUS from cultivation has been substituted by a Russian physician for ordinary vaccine lymph, which is said to be as effective as the latter, and of course free from the danger of syphilis, tuberculosis and other constitutional diseases.

TO PRESERVE ICE in the sick room, put it in a bag, and then in a box containing enough chaff to cover it five or six inches deep. It can thus be preserved for several days.

FROM Bordeaux U. S. Consul Gifford warns the American public to beware of French liquors, especially brandy, because no pure French brandy is sent hither.

THE PACKET, of Orillia, says, there have been many cases of typhoid fever in Penetanguishene of late, and as usual in such cases the Board of Health is only now beginning to stir itself. "Is the same experience to be again repeated in Orillia? There is typhoid here, and last spring there were many cases of scarlet fever and diphtheria; nearly all of which proper sanitary precautions would have prevented."

DOCTOR Charles Theodore, Duke of Bavaria, the philanthropic physician, recently celebrated at Tegesee, in Bavaria, his removal of the thousandth cataract from the eyes of his poor patients. It was made the occasion of a great ovation.

NO DOUBT about it. Dr. Porter, of Connecticut, estimates that the money lost to this country (U. S.) by sickness and death, is annually five and one-half thousand millions of dollars.

DRY ROT is believed to be contagious, and it is said that the germ of that disease may be communicated to sound wood by tools which have been at work in that diseased. It is thought possible that the theory accounts for many incomprehensible breakages of timber.

THE LATEST experiments show (Am. Lancet) show that the scrubbing of the hands with soap and hot water is more important than the use of any particular antiseptic solution for purposes of disinfection.

SHOULD the entire carcass of an animal (only locally) infected with tuberculosis be condemned as unfit for food? A recent decision in a test case in Glasgow, Scotland, answers this query in the affirmative.

THE Medical Record says that suicide have diminished since a law was enacted punishing the attempt.

According to Dr. Cornet, tuberculosis is five times more frequent among nurses than any other class of persons.

FOR BALDNESS AND DANDRUFF, the Canada Lancet says, a solution of chloral hydrate, five grains to the ounce of water, is good. "It will clear the hair of dandruff, and prevent its falling out from that cause." In many instances where the patient is nearly bald the application of this will restore the hair. Arnica oil is also an admirable remedy. A small quantity well rubbed into the scalp three or four times a week can be used with expectations of benefit.

PHILADELPHIAN, I wish you, sir, to observe the color of that water I have just drawn from the pipes. Councilman—Oh, that is all right. The color is not due to the impurities, but the air in the water. "Air?" "Yes, you see as the limpid streams which enter the Schuylkill go leaping bubbling and singing through their mountain glens the soft, brownish Indian summer atmosphere permeates the liquid and gives it that pleasing, poetic, terra-cotta hue."

THE DEATH-RATE is higher in towns than in the country, but this difference is less marked now than formerly. The attention paid of late years to sanitary science has been accompanied by a striking decrease to the death-rate, an improvement great enough to give 1,800,047 additional years of life to the 858,878 children annually born in England and Wales, thus extending the lifetime of the 437,492 males by a year and a half each, and of the 421,386 females by at least two-years and three quarters.

ON ANTI-FAT treatment, an "L. R. C. P." writes in a recent number of the British Medical Journal. He says: What is wanted is a gradual diminution of weight without privation or inconvenience. This can be done simply by leaving off two or three fattening articles of food or substituting others for them. I thought I was too heavy. I left off beer (of which I previously took two pints a day), bread (eating toast instead), potatoes, and sugar in tea and coffee. I made no other alteration whatever, eating pudding, vegetable, meat, fat, and drinking claret, sherry, etc., as usual. He gradually lost 19 lbs., and continues: I feel the better for it, and am convinced that a gradual diminution of weight attained in this way is much better and likely to be of more lasting benefit than a quick fall attained by any severe system.

A CASE of small-pox which recently occurred in Aberdeen is said to have been contracted from handling raw flax and jute imported from Russia.

IN SPAIN sanitary reform is being vigorously urged by the Society of Hygiene. It will not be the fault of the society if a hygienic millennium is not soon brought about in that romantic country.

RECENT researches in France point strongly toward the view that cancer will be proved to be a parasitic disease, produced by germs similar to those which produce some forms of skin disease.

PROF. JACOBI says diphtheria may be communicated by many animals besides man. It has been traced to the following: Pigeons, turkeys, chickens, pheasants, cats, horses, sheep and cows. Vegetables, milk and other foods may convey it. It is also carried by clothing, furniture, railroad cushions, etc.

DR. KARL KILCHER, Prague, swallowed, as an experiment, some blood of a man who had died of typhus fever. The death from septicæmia of this enthusiastic devotee of science is now announced.

A WOMAN, on whose body an inquest was recently held in London, is described as having been the greatest chloroform taker in the world, customarily taking as much as a pint a day. The various organs of her body were described as being healthy.

THE Pennsylvania Railroad Company has issued orders requiring a thorough cleansing and disinfecting of all its passenger coaches at least once a week.

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#### NOTES ON CURRENT LITERATURE.

VERY PRETTY ILLUSTRATIONS are given in late numbers of the Illustrated London News: notably, "The Return of the Wanderer"; and, in the last issue just received, Sept. 14, are, full page, "Caught by the Tide," "Hans and Greta," "Summer," "Edith," and, double page, the "Courier of the Desert," all very attractive. There have been many charming scenes in Wales in connection with the Queen's visit there. Wilkie Collins' thrilling story, "Blind Love," is very handsomely illustrated.

DR. M. Allen Starr will have an article on "The Old and the New Phrenology," in the October "Popular Science Monthly," showing, with the aid of illustrations, what has been definitely learned about the location of the various mental faculties in the brain, and how the errors of Gall and Spurzheim have been exposed.

A DELIGHTFUL STUDY of animal life and character is contributed by Olive Thorne Miller to the September "Popular Science Monthly," in the shape of a description of a pet lemur which the author possessed, and which represents a group of animals closely allied to the monkeys.

THE September CENTURY contains a paper on Napoleon Bonaparte of unusual interest and

importance, being contemporary accounts, by British officers, of the ex-Emperor's exile to Elba; his voyage to St. Helena and life on that island. Mr. Paine, whose article on the "Pharaoh of the Bondage" will be remembered, presents an illustrated study of the identity of "The Pharaoh of the Exodus and his Son"—in the light of their monuments.

PROFESSOR GEORGE P. FISHER of Yale University will contribute to The Century during the coming year a series of papers on The Nature and Method of Revelation, in which he will touch upon a number of questions of living interest at the present time, in connection with Christianity and the Bible.

FOLLOWING the article on the late Miss Laura Bridgman, in the August ST. NICHOLAS, the number for September contains a full and interesting account of "Helen Keller," a young girl who, also, is deaf, dumb, and blind. Mary Hallock Foote tells the sad story of "The Lamb that could n't 'Keep Up,'" and a beautiful drawing illustrating the little story forms the frontispiece of the number.

THE August Good Health contains the fourth of Dr. Oswald's "International Health Series"—an illustrated paper on Italy. S. Isadore Miner has an article, "How to Keep Cool" from a standpoint of health and comfort. The third paper by Dr. Kate Lindsay in Dress department, is "The Repression System in the Training of Girls." Dr. Lindsay states that "Most of the women who have ever amounted to anything were 'Tomboys' in their youth"! also "The Educational Needs of To-Day" by E. L. Shaw, gives in the one word *educate* the peaceful solution of the labor question.

#### UNCALENDARED.—FROM THE CENTURY.—

ONLY a year have thou and I been friends,  
If time be counted on our calendar;  
Away with that! What it begins, it ends:  
From all eternity, close souls we were,  
And shall we, so God grant! forevermore,  
For two were never faster bound before.

"With God, one day is as a thousand years:"  
Oh, Love is mighty, God's most blessed name!  
The more that man his Maker's image bears  
The more must months and æons be the same.  
Love knows not time—It is eternity,  
And not a year, that I count out with thee!