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PRACTICAL HYGIENE.

THIRD PAPER.

AIR IN ITS RELATIONS TO HEALTH.

SECTION V.

AIR VITIATED BY DECOMPOSING ANIMAL MATTER—CARCASES ON THE GROUND, BODIES IN GRAVEYARDS, STABLE MANURE, &c.

The evidence is conflicting, and opinions differ materially, as regards the composition, and the effects upon the health, of air containing affluvia from decomposing animal bodies on the surface of the ground and in grave yards, and also from manure in heaps and when spread upon fields.

AIR OF GRAVEYARDS.—The decomposition of animal bodies gives rise to a very large amount of carbonic acid gas. Parkes says it has been calculated that when intramural burial was carried on in London, 2½ millions of cubic feet of carbonic acid were disengaged annually from the 52,000 bodies then buried. Ammonia and an offensive putrid vapor are also given off by decomposing animal bodies. The air of cemeteries usually contains more carbonic acid than ordinary air, while the organic matter is perceptibly larger when tested by potassium permanganate.

EFFECTS OF EFFLUVIA FROM ORDINARY MANURE.—There is no evidence that any serious disease has arisen from collections of stable manure, or from the spreading of this upon fields, either to the workmen engaged in moving or spreading it, or to those living in the immediate neighborhood. The spreading of manure of this sort upon fields in the proximity of dwellings has been complained of as a nuisance, however, and has been said to have caused diarrhœa and general disturbed health amongst those living in the dwellings.

It cannot be otherwise than that the breathing of the organic affluvia arising from decomposing matter of this sort will cause more or less derangement in the bodily functions, especially in those who are not very vigorous; while in the more vigorous the disturbance might not be perceptible.

EFFECTS OF BREATHING THE AIR OF GRAVEYARDS.—On this we quote the following from Dr. Parkes: There is some evidence that the disturbance of even ancient places of sepulture may give rise to disease. Vicq d'Azyr refers to an epimetic in Auvergne caused by the opening of an old cemetery; the removal of the old burial-place of a convent in Paris produced illness in the inhabitants of the adjoining house. In India, the cantonment at Sukkur was placed on an ancient Mussulman burial ground, and the station was most unhealthy, especially from fevers.

The effect of effluvia from comparatively recent putrifying human bodies has been observed by many writers. Rammazzini states that sextons entering places where there are putrifying corpses are subject to malignant fevers, asphyxia, and suffocating catarrhs; Fourcroy remarks that there are a thousand instances of the pernicious effects of cadaveric exhalations; and Tardieu has collected a very considerable number of cases, not only of asphyxia, but of several febrile affections produced by exhumations and disturbances of bodies. Mr. Chadwick, and the General Board of Health, have also summed up the recent evidence, which shows that in churchyards thickly crowded with dead, vapours are given off which, if not productive of any specific disease, yet increase the amount both of sickness and mortality. In some instances, this may be from contamination of the drinking water; but in other cases, as in the houses bordering the old city graveyard, where the water was supplied by public companies, the air also must have been in fault. In the houses which closely bordered the old city yards, which were crowded with bodies, cholera was very fatal in 1849, and I was informed by some practitioners that no cases recovered. I was also informed that all other diseases in these localities assumed a very violent and unfavourable type.

EFFLUVIA FROM DECOMPOSING ANIMALS.—On this point there is some discrepancy of evidence. In 1810, Deyeux, Parmentier, and Pariset, gave evidence to show that the workmen in knackeries are in no way injured. Parent-Duchâtelet from his examination of the men employed at the knackery and slaughter-house at Montfaucon,

came also to the conclusion that their health was not affected. It should be mentioned that this knackery is remarkably well placed for ventilation, and is excellently well conducted ; putrid remains, in the proper sense of the word, do not now exist in any knackery in or near Paris ; the workmen are all well paid and well fed, and are therefore prepared to bear the effect of any injurious effluvia. It has been stated, however, that in the Hôtel Dieu, the patients used to suffer when the wind, loaded with effluvia, blew from Montfaucon (Henry Bennet). Tardieu, from a late re-examination of the question, confirms Parent's conclusions, except as regards glanders and malignant pustule, touching which Parent-Duchâtelet's evidence was as usual negative. Tardieu (t. iv. p. 468), however, states that many examples occur in the French knackeries of the transmission of these diseases, though glanders and farcy are less frequently caught in knackeries than in stables. No analysis has yet been made of the air of knackeries.

Parent-Duchâtelet is often also quoted, as having proved that the exposure of the remains of 4000 horses, killed in the battle of Paris in 1814, produced no bad effects. These horses were killed on the 10th and 12th of April. They gave out "une odeur infecte," which produced no bad results on those who collected the bodies. Parent-Duchâtelet inquired particularly whether typhus was produced by the effluvium, and proved that it was not ; a conclusion conformable to our present doctrine. He did not, however, do more than examine the registers of deaths for the three years before, during, and after the battle, and found no evidence of increased mortality. The utmost this observation shows is, that no typhus was produced ; and that no amount of decomposition, caused by eleven days of hot weather, did not affect those concerned in collecting and burning the bodies.

On the other hand, the experience of many campaigns, where soldiers have been exposed to the products of an advanced putrefaction of horses, shows that there is a decided influence on health. Pringle especially notices this ; and in many subsequent campaigns this condition has been the causes of insalubrity. Diarrhœa and dysentry are the principal diseases ; but all affections are increased in severity. At the siege of Sebastopol, where, in the French camp, a great number of bodies of horses lay putrifying on the ground, Reynal describes the effect as disastrous, and even conjectures that the spread of typhus was connected with this condition, though this is unlikely.

PROCEEDINGS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

SEVENTH ANNUAL MEETING, NASHVILLE, TENN., NOV. 18-21, 1879

The meeting was held in the hall of the House of Representatives, and called to order on Tuesday, November 18th by Prof. J. L. Cabell, M. D., President, at 12 o'clock. Prayer was offered by Rev. O. P. Fitzgerald, of Nashville.

THE DRAINAGE AND SEWERAGE OF CITIES.

BY COL. GEO. E. WARING C. E., OF NEWPORT, R. I.

The President has asked me to prepare a paper concerning the most perfect methods of city sewerage, one which may serve as a standard of comparison in considering the character of existing work. It would savor of presumption to describe or to prescribe methods radically different and better than those now in use. It is impossible to foretell the improvements which are to grow out of the present rapidly increasing interest among intelligent and ingenious men in all that relates to sanitary practice. If I were to attempt now to set forth the details of a perfect system of sewerage I fear that my recommendations, like Dr. Richardson's City Hygeia, would surpass what practical men and investors of capital would accept.

The most that it is prudent to do is to consider the question in its purely sanitary bearings, and to indicate in what way the best requirements of public health may be met, in the light of our present knowledge.

So far as we can judge of the future from the indications of the present, it would seem that, in one respect, we are to witness a very marked change in the practice of sanitary engineering. There is much reason for believing that there will be a distinct separation between the application of sewerage to the removal of domestic and manufacturing wastes and soil water and the construction of conduits for the protection of public and private property against the action of storm water. This latter, like the construction of roadways and bridges, will be treated as a purely civil engineering question, having, at best, only an indirect sanitary relation. The interests of public health, so far as sewerage is concerned, will, in my opinion, be best served by a close adherence to the collection and removal of foul waters, and to their proper and final disposal.

This suggestion is not new. The discussion between the advocates of the combined and the seperate systems of sewerage, especially in England, has long been active. The issue between them seemed doubtful until the matter of agricultural or chemical purification of the effluent became prominent.

The arguments in favor of the exclusion of storm water from the sewers proper, seem to me so conclusive, that I no longer hesitate to accept such separation as essential to the best sanitary sewerage.

Sewers large enough to remove storm water, according to the usual formulas, are open to several serious objections.

The question of cost is so often the controlling question, even in improvements of the most vital importance, that the expense entailed by the construction of storm-water sewers constitutes an insuperable obstacle in the case of many a small town where sewers is most necessary. Even in the larger cities the expenditure in this direction might sometimes, if not always, be economized for the benefit of other necessary work.

The larger the sewer the more difficult becomes the matter of ventilation.

Cases are extremely rare where sewers of the storm-water size are not, at least during the dry and hot season, sewers of deposit to such an extent as to have their air made most foul by the decomposition of their sediment.

Where the question of final disposal has become important, the admixture of storm water with the sewage leads to the constant embarrassment of the system, whether the process be chemical or agricultural.

There seems to be no controlling reason why storm water should be admitted to the sewers at all for very long reaches of the street; and not seldom, throughout the whole of the smaller towns, the whole rain-fall may be discharged over the surface without causing inconvenience.

Until about 1854 the cities of Albany and Troy, both large towns, and both having very steep grades, terminating on level ground, had no storm-water sewers. The inconvenience caused during heavy storms was inconsiderable, and there was practically no material injury to public or private property. I am informed by the engineer of both cities that neither inconvenience from the overflowing of the streets nor injury from wash constituted an essential argument in

favor of the sewerage. The sewers were built to the storm-water rise only, in confirmity with the general custom.

The carrying of surface water to the depth of 10 or 15 feet below the surface seems to be at least unnecessary. Street wash can be safely admitted to sewers only after passing through settling basins, which are sure to accumulate an offensive and dangerous amount of decomposing filth.

I believe that one of the most important improvements that we are destined to see is the removal of storm-water, as far as possible, by surface gutters—carrying away the greater accumulations through very shallow conduits, largely perhaps, through covered gutters, easily accessible for cleaning and flushing.

This part of the engineering problem being satisfactorily provided for, the sanitary drainage of a town—the removal of the wastes of its population—becomes a simple problem. It implies, however, one condition which, although almost unknown in America, has been shown by foreign practice to be an attainable one—that is, that it requires that the streets be kept clean by some other means than occasional drenching by storms. There is no more inefficient, costly and dangerous scavenger than the rain which falls upon the surface of our roadways and washes their horse-droppings into the catch-basins at the street corners.

In my judgmeut a perfect system of sanitary sewerage, for a small town or a large one, would be somewhat like the following :

No sewer should be used of a smaller diameter than six inches, because (a) it would not be safe to adopt a smaller size than 4-inch for house drains, and the sewer must be large enough surely to remove whatever may be delivered by these ; (b) because a smaller pipe than 6-inch would be less rapidly ventilated than is desirable ; (c) and because it is not necessary to adopt a smaller radius than three inches to secure a cleansing of the channel by reasonably copious flushing.

No sewer should be more than six inches in diameter until it and its branches shall have accumulated a sufficient flow at the hour of greatest use to fill this size half full ; because the use of a larger size would be wasteful, and because when a sufficient ventilating capacity is secured, as it is in the use of a 6-inch pipe, the ventilation becomes less complete as the size increases, leaving a larger volume of contained air to be moved by the friction of the current, or by extra

neous influences, or to be acted upon by changes of temperature and of volume of flow within the sewer.

The size should be increased gradually, and only so rapidly as is made necessary by the filling of the sewer half full at the hour of greatest flow.

Every point of the sewer should, by the use of gaskets or otherwise, be protected against the least intrusion of cement, which, in spite of the greatest care, creates a roughness which is liable to accumulate obstructions.

The upper end of each branch sewer should be provided with a Field's flush tank of sufficient capacity to secure the thorough daily cleaning of so much of the conduit as from its limited flow is liable to deposit solid matter by the way.

There should be sufficient manholes, covered by open grating, to admit air for ventilation. If the directions already given are adhered to, manholes will not be necessary for cleansing. The use of the flush tank will be a safeguard against deposits. With the system of ventilation about to be described, it would suffice to place the manholes at intervals of not less than 1,000 feet.

For the complete ventilation of the sewers it should be made compulsory for every householder to make his connection without a trap, and to continue his soil pipe to a point above the roof of his house. That is, every house connection should furnish an uninterrupted ventilating channel four inches in diameter throughout the entire length. This is directly the reverse of the system of connection that should be adapted in the case of storm-water and street-wash sewers. These are foul, and the volume of their contained air is too great to be thoroughly ventilated by such appliances. There atmosphere contains too much of the impure gases to make it prudent to discharge it through house-drains and soil-pipes. With the system of small pipes now described, the flushing would be so constant and so complete, and the amount of ventilation furnished, as compared with the volume of air to be charged, would be so great that what is popularly known as sewer-gas would never exist in any part of the public drains. Even the gases produced in the traps and pipes of the house itself would be amply rectified, diluted and removed by the constant movement of air through the latter.

All house connections with the sewers should be through inlets pointing in the direction of the flow, and these inlets should be fun-

nel-shaped, so that their flow may be delivered at the bottom of the sewer, and so that they may withdraw the air from its crown—that is, the vertical diameter of the inlet at its point of junction should be the same as the diameter of the sewer.

All changes of direction should be on gradual curves, and as a matter of course, the fall from the head of each branch to the outlet should be continuous. Changes of grade within this limit, if considerable, should always be gradual.

So far as circumstances will allow, the drains should be brought together, and they should finally discharge through one or two main outlets.

The outlet, if water-locked, should have ample means for the admission of fresh air. If open, its mouth should be protected against the direct action of the wind.

It will be seen that the system of sewerage here described is radically different from the usual practice. I believe that it is, in all essential particulars, much better adapted to the plan of sanitary drainage. It is cleaner, much more completely ventilated, and is exactly adapted to the work to be performed. It obviates the filthy accumulation of street manure in catch basins and sewers, and it discharges all that is delivered to it at the point of ultimate outlet outside the town before decomposition can even begin. If the discharge is of domestic sewage only, its solid matter will be consumed by fishes if it is delivered into a water-course, and its dissolved material will be taken up by aquatic vegetation.

The limited quantity and the uniform volume of the sewage, together with the absence of dilution by rainfall, will make its disposal by agricultural or chemical processes easy and reliable.

The cost of construction, as compared with that of the most restricted storm-water sewers, will be so small as to bring the improvement within the reach of the smaller communities.

In other words, while the system is, in my judgment, the best for large cities, it is the only one that can be afforded in the case of small towns.

Circumstances are occasionally such, as in St. Louis, as to require extensive engineering works for the removal of storm water through very deep channels. Ordinarily, as I have before said, the removal of storm water is a very simple matter, if we will accept the fact that

s best removed, so far as possible, by surface gutters; or, in certain cases, by special conduits placed near the surface.

It is often necessary, in addition to the removal of house waste, to provide for the drainage of the subsoil. This should not be effected by open joints in the sewers, because the same opening that admits soil water may, in dry seasons and in porous soils, permit the escape of sewerage matters into the ground, which is always objectionable. Soil-water drains may be laid in the same trench with the sewers, but preferable on a shelf at a higher level, and they should always deliver into the upper part of the sewer, or into a manhole at a point above the flow-line of the sewerage.

There is one point connected with the drainage of towns which is not sufficiently appreciated, especially in this country; that is, that it is easy and cheap to secure a deep outlet to lowland, and to deliver sewerage at a considerable elevation for agricultural treatment by artificial pumping.

The average cost of pumping for water-works is about 9 cents per foot of elevation for each million gallons raised.

On this basis the cost of raising the sewerage of a town of 10,000 inhabitants, supposing every three persons of the population to contribute 100 gallons per day to the flow, would be about 3 cents per day for each foot of elevation.

Even supposing that 20 inches, or about one-half of the annual rainfall, finds it way into the subsoil, the cost of lifting this 10 feet to a surface outlet would, on the same basis, cost only about $160 per annum for each 100 acres of the town area.

Both of these estimates are practically somewhat too low, because a small amount of water cannot be lifted relatively so cheaply as a large amount. I give these figures only to show that, with a community of any considerable size, it is really a matter of minor consequence whether the natural outfall is high or low.

The experience of Holland, in the practice of drainage, indicates a complete relief for the natural disadvantages even of the city of New Orleans, of which the cost would be quite insignificant, as compared with its benefits.

Many of our riparian towns, dependent upon high lying water as the outlet for their drainage, or, like Chicago and Milwaukee, delivering their foul drainage into streams whose contamination means the contamination of the town itself, may find their only practical relief by means of an artificial outlet. The City of Boston is now estab-

lishing a conspicuous example of the application of mechanical power to deep drainage and distant removal, even applying this costly means for the discharge of the rainfall of an enormous area.

Aside from its benefit in securing deep drainage, discharge by pumping makes us quite independent of natural topography in adopting means for agricultural disposal. Pumping, and the separate removal of foul wastes, puts it in our power, under all circumstances, to adopt this means of purifying our outflow. Along our greatest rivers, from the sanitary standpoint, the disposal question counts for nothing. The Mississippi River will annihilate the sewage of St. Louis to whatever size she may grow; but there is an enormous proportion of our towns which must, for purely sanitary reasons, adopt some other means of outlet than delivery into rivers and harbors.

There is an agricultural consideration, and an important one, which looks to the utilization of all our sewage, but in the present condition of our agriculture this must remain a secondary argument. Wherever we resort to irrigation as a means of purification, the manurial value of the sewage will serve to lessen the cost of our work. Probably it will nowhere pay the whole cost.

The methods of irrigation disposal are various and all are not equally well adapted to all conditions. The outflow of a large town can be purified satisfactorily, either by simple irrigation over large areas, or by intermittent downward filtration over much smaller areas of land properly graded and deeply undermined. Under this system the discharge is intermittent, and during the intervals the soil-filter is purified by atmospheric action.

The outflow of smaller towns, of public institutions and of suburbs and country houses, may be much the more satisfactorily treated by the absorption drain or sub-surface irrigation system, working in conjunction with Field's flush tank. By this system a small area of land, naturally or artifically well-drained, is underlaid at a depth of ten inches from the surface, by a series of open-jointed, agricultural drain tiles. At each discharge of the flush tank, the accumulated sewage is sent rapidly into the tiles, whence it escapes through the open joints into the soil. During the interval between the discharges, the water, purified by filtration, settles away to the subsoil, and fresh air enters to supplement, by oxidation, the purifying action of the roots of the grass or other crop growing on the land.

This latter system has now been so thoroughly tested under various conditions as to climate and quality of soil, as to have proved itself of almost universal applicability. It has the very great advantage that, as the sewage never appears at the surface of the ground, it may be carried on in immediate proximity to the dwelling. It would be equally effective, under proper arrangement, in dealing with the sewage of cities; but for such use it would be much more costly than would the removal of the sewage to a distant field, where surface irrigation would be unobjectionable.

I trust that, as I am neither a Southerner nor a physician, I may be excused for attaching more importance than many of you probably do to the proper drainage and cleansing of the city, and to the proper disposal of its outflow, than to any system of quarantine. My knowledge of the history of the yellow fever epidemics in this valley is infinitely less than yours; but I feel warranted, and I take my warrant from the history of the plagues which devastated the filthy mediæval cities of Europe, and from my own knowledge of the want of cleanliness and want of drainage in the city of Memphis, in venturing the suggestion that even that fever-smitten town may be made an impossible field for the invasion of yellow fever in an epidemic form.

While yellow fever is for the moment uppermost in all our minds, and while its sudden and more fatal outbreaks strike the public imagination with peculiar force, we should as sanitarians, never lose sight of the fact that it is one of our minor diseases; that, indeed, along the banks of the Mississippi river far greater mortality and infinitely greater disability results from the constant operation of diseases which should come equally within our purview, and which are equally preventable by measures of sanitary improvement.

Dr. Azel Ames, of Wareham, Mass., said that he regretted that Col. Waring had been willing, with his vast knowledge and experience, to place in secondary position the outside disposal of sewage. In considering many systems of sewerage, they should look to the end of what they undertook. The absolute and final disposal of sewage was no secondary matter. They could not do better than to consider the things together. The difficulties in making the separation were great; but, in adopting this system, the final disposal must always be a tag to it. The construction of streets, too, was very closely allied to this question. The cost of pumping had not been

met, and he was surprised that it had not ; but it could be met by inexpensive apparatus depending on compressed air. He was glad the junction of sewers had been so enlarged on, as most of the difficulties experienced in sewerage were dependent upon the improper junction of the sewers. He would ask Col. Waring as to the use of flush tanks, whether there was any emanation from them in large accumulation ?

Col. Waring : " Never, when properly arranged."

Dr. Wight of Milwaukee, was sorry to disagree with Dr. Ames, on one point. It was an axiom in sanitary science that all organic refuse should be removed before undergoing decomposition. It had been proved that organic matter was most poisionous just before passing into the putrefactive state. The primary question, then, was the question of prompt removal. The question of ultimate disposal was a secondary matter.

He fully agreed with Col Waring as to the necessity of separating storm water from the sewage proper, or the drainage of dwellings, etc. But some kinds of organic matter cannot be removed by sewerage of any kind. Garbage must be carted away, and that within twenty-four hours—before it could pass into the condition of putrefaction. England was giving more attention to this matter of late years. In Manchester, half a million of people had recently been brought within a system of removal by carts. Eighty thousand pounds has been appropriated for the construction of a factory in which this kind of refuse matter was changed into a serviceable and a saleable manure. Glasgow had brought 80,000 of her population within a system of dry removal. The two systems must be combined to secure effective sanitary results. In regard to the prevalence of epidemics, he believed that yellow fever, typhoid fever or diphtheria could not possibly become epidemic in a city or town that was kept clean. He was in favor of a system of quarantine. He held it to be the duty of the Federal or State Government to prevent the removal from one place to another of merchandise or effects which might carry contagion to places previously free from disease.

Dr J. W. Comptom, of Evansville, Ind., agreed with Col. Waring as to the dangers of underground sewerage. His city suffered from sewer-gas emanating from twelve miles of sewerage, with a population of 40,000. A number of branch sewers from slaughter-houses contributed to this result. Evansville had 100 miles of surface-drained

streets. The sewers were very impure, from the quantity of matter going through. Where impure sewers existed. they were liable to become hotbeds for the propagation of diseases. The sewers did not have sufficient fall to drain themselves, and hence their danger. Much that he had intended to say had been said in the paper under discussion.

Dr. A. N. Bell of New York, said he had listened with the more pleasure to the reading of the paper, because it had replied so well to a recent address by Dr. Fergus, whose objections to the water-carriage of sewerage was not applicable to the system of small sewers, so ably presented in the paper before us; but to the systems of unsanitary engineering which now commonly obtain in our large cities. He was fully persuaded that no subject was so well fitted to open this meeting or more worthy of the attention of the Association. Nearly allied to the subject of sewerage and drainage, indeed a part of it, is that of pavements; and without good sewerage and drainage our southern cities can have no good pavements, on account of the softness of the soil. He would like to hear Col. Waring's opinion on the material for making sewers. Nothing was so filthy as brick, fully saturated with excrementitious matter, and yet this was the material most used. The suggestions made as to disposing of sewage at once, and not storing it up in our rooms, and around our houses, to poison so many people with foul gases, were fully approved by Dr. Bell. But however perfect these arrangements, we should not forget, he said, that ships, too, have their foul drains, and he would be sorry to think that Col. Waring's allusion to the subject of quarantine as being of lesser importance as compared with civic cleanliness—including sewerage and drainage—but it was, nevertheless, a powerful arm of defense against the introduction of epidemic diseases, and we cannot afford to belittle its importance.

Dr. Lloyd Howard, of Baltimore, said that they were but few sewers in Baltimore. These were tapped by certain hotels. The drainage was surface drainage. He combated the idea that sewers would banish the yellow fever from Memphis. If quarantine was to be abandoned and the sewerage fallacy taken up entirely, they would find themselves vastly mistaken. It had been demonstrated that yellow fever could prevail in a town which was clean. He believed in strict quarantine.

Col. T. S. Hardee, of New Orleans, said that Dr. Ames had alluded

to the idea of using compressed air in connection with sewerage. He would state that the idea had already been put in practical operation in Great Britain, under the name of Shone's system, and was considered, as far as could now be judged, superior to any other plan for getting rid of the disadvantages connected with sewerage.

Col. Waring said he had received a full description from the inventor of the method.

Dr. Tadlock, of Knoxville, Tenn., said that sewerage had for years been left to plumbers ; but of late years sanitarians had taken up the question. In Knoxville they were opposed to any kind of sewerage, as they had fine surface drainage and no low land. However necessary it might be for large cities, there were many towns better off without it. There was a feeling against bringing in pork that had been fed on sewage. In Tennessee there was a law against polluting the water of streams, but it was violated by every city and town which turned its filth into them, poisioning the fishes and making them unfit for food.

Dr. Elisha Harris, of New York, wished to call attention to the importance of securing a copious water supply in furtherance of a sewage system. The great question with sanitarians was what system of sewerage was required. In small towns he found, from inquiry, the supply of water for one person ranged from 100 to 30 gallons. The sewers should be supplied with water sufficient to float the sewage. The old system of sewerage fell far short of what sanitary science now demanded. Having visited certain cities, and examined their sewerage, he found, with other faults which had been mentioned, that the engineering of the systems was far from ample, and did not correspond with the needs of the several cities. He thought the great want of this question was some recognized standard of fitness and excellence.

Dr. Ames thought it was just as important to find a place of deposit—upon low places or upon farms—as it was to provide sewerage pipe to conduct filth from cities. The time would come when all the garbage of cities would be carried off and used for agricultural purposes.

Dr. E. M. Hunt, of Metuchin, N. J., characterized the system of Col. Waring as wholly revolutionary in character, in requiring three separate and distinct methods of removal of injurious matter, viz : a storm water system, a house drainage system, and separate system

for excrementitious matter. He did not believe that the effective capability of a sewer could be determined in inches; more depends upon the question of velocity of flow and the hydraulic pressure. He would draw attention to the fact that natural underground streams frequently interfered with the working of sewers. As to the substance of which sewers should be constructed, he did not consider brick as objectionable, provided the brick was well burned and tested, and laid in good cement.

In reply to a question, Col. Waring explained that in using the term pipe, he referred to vitrified clay pipe.

Dr. A. L. Cihon, United States Navy, said Dr. Howard had anticipated a question which he wished to ask, concerning the sewerage of Baltimore.

Col. Waring said he had been unfortunate in his effort to make himself understood on quarantine. The idea that he intended to convey was that a cleanly condition would aid quarantine. They, as sanitarians, could talk sewerage, but it was for the people who had the bills to pay, who had to carry them out. If sewerage could not be effected, we must not mislead the people with the idea that sewage utilization would pay the cost of sewerage; we must show them that the sanitary result is a sufficient argument for sewering any town. In reply to Dr. Hunt: I do not recommend "three separate and distinct methods of removing injurious matter, viz: a soil water system, a house drainage system, and a separate system for excrementitious matter; but I recommend one system of small pipe sewers for all house drainage, including excrement, supplemented with agricultural drain tiles, whose sole purpose should be to carry sub-soil water to these sewers, and which could be laid in the same trenches. In reply to the question of Drs. Howard and Gihon, he would say that he advocated what was known as the Baltimore plan, aided by such machinery as might be needed. He explained at length the system of sewerage advocated in the paper which he had read. A test of the flow of water in sewerage had been made in Rhode Island on Monday morning, the Rhode Island washing day. The sewer tested was used by 267 persons, and the flow of water at the most was three-fourths of an inch, and that only for an instant. The sewer was twelve inches in diameter. He also gave examples of the tests now being made in New York city.

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CITY SCAVENGING AT BOSTON.

BY E. C. CLARKE, C.E.

The subject of sewerage having been elsewhere fully discussed, it is proposed to treat of the removal of such material as must be carried away, and to tell how such work is done in Boston.

The work devolves upon a committee of five members of the City Council chosen annually ; they control the expenditure of the appropriation annually made.

The superintendent of the work, however, is appointed by the Board of Health and approved by the Mayor. The Board can request that the scavenging shall be done to its satisfaction. Notwithstanding the frequent changes in the personnel of the Board of Health, city physician, superintendent, etc., the system has been found in the main to work well. The secret of this is that very few changes are made in the superintendent, and those who do the work. All the men employed are fitted by long training for the performance of their duty—all the foremen have have been promoted from subordinate positions—few of the laborers have been employed less than five, many have served for twenty, and some for thirty or forty years. The permanence of the employment makes the places on the force to be eagerly sought for, and insures good conduct on the part of the laborers—which is further encouraged by the prospect of promotion, and also by the fact that it is the custom with families to give a gratuity at Christmas to those who have served them for years.

Scavenging includes removal of house effects—removal of ashes and dry house dirt, cleaning of streets and street catch basins, and cleaning of privy vaults and cess pools ; for each of these a special and separate provision is made. Offal, meaning refuse food and matter known as swill, is taken daily from hotels, restuarants, etc., and two or three times a week from dwellings by wagons, each having a driver and helper. The wagons are built by the city, are water tight, and covered by a wooden lid. They start out at 4 A. M., first visiting hotels and restaurants; after 7 o'clock dwellings are visited. The driver rings at the yard gate or basement door, goes to the swill tub, empties the contents into his buckets, replaces the tub, and leaves the house. Should no effects be found, it is assumed that it has been improperly disposed of, and the matter is reported and investigated.

The wagon, when filled, is driven to the department depot, emp-

tied upon a raised platform, and thoroughly washed and scrubbed before making another trip. There is no trouble in getting rid of the material. Regular customers come daily and take it away. The wagons of these parties are numbered and licensed, made water-tight, and the owners made responsible for damage from leakage and other offense. The wagons are also of known capacity, and the material is *paid for* at the rate of five to seven dollars a cord. The sales of last year amounted to about $28,000. The cost of collecting and removal was $76,000. Ninety-six men and forty-five wagons were employed. In sparsely settled suburbs permission is given to private families to use their own swill for feeding hogs, but the superintendant uses his own discretion in such cases.

Ashes are removed in carts built by the city. Hotels, stores and tenement houses are visited twice a week, dwelling houses once a week ; 117 men and 58 carts are employed ; with each cart goes a driver and helper, who enter the house or yard, carry out the ash receiver, empty it into the cart and return it to its place. Men are not required to go up stairs ; ashes must be brought to them at the ground floor.

It is worth noting that no stealing results from this visitation of dwellings. The men are so well known that they are on good terms with the citizens whom they visit ; but one complaint of anything being stolen has been made in twenty years. The carts, canvas covered, when filled are taken to the nearest dumping ground.

It is hardly possible to find a place for dumping ashes which is free from objection. It is unfit for filling, because always mixed with miscellaneous household rubbish, dead rats and mice, etc. The ashes and house dirt are used to grade streets and parks belonging to the city, also private lands, when desired or permitted by the owner. This is unsatisfactory, for the reason that years afterwards when trenches are dug for gas or water pipes, it is found that decomposition is still going on ; where it is used for filling open squares and pleasure grounds no harm results, because, to support vegetation it must be covered with good earth, and the trees and plants thrive upon the products of decay. But to dump house dirt upon land upon which houses are to be built is a serious evil.

The larger animals which die upon the streets are removed by a a contractor for the privilege of possessing the carcass. The police notify the contractor, who dispatches a cart and removes the body—

takes it to an island in the harbor, where every vestige of it is utilized. The business pays well, but the process is very offensive, and the stench is sometimes carried by certain winds three miles to the city. The cost of removing ashes and house dirt last year was $97,000.

In street cleaning, 185 miles of streets are swept and cleaned every week; those most frequented, daily; others, twice a week. Macadamized streets are not swept; they merely have their gutters cleaned and rubbish raked up and removed. Street cleaning, and all other work of the Health Department, is done by daylight. Night work has been found to be neither efficient or economical. Both sweeping machines and hand labor and birch brooms are used in street sweeping—a one horse machine, with revolving brush, does the work of eight men, and much more cheaply, but will not clean corners and depressions as a broom can. 48,000 cart loads of dirt; each 40 cubic feet, were collected last year, and disposed of in the same manner as the ashes and house dirt. It is rarely that it has enough value as a manure to be found salable. 170 men are employed in street cleaning. In winter, when the streets are covered with snow and ice, the force is employed in cleaning crossings, and removing snow from city sidewalks and grounds, while the carts assist in the work of carting away ashes, of which there is so much more to do at that season. During last year the cost of street cleaning was $83.000.

Street catch basins, connecting with the sewers, are built by the Sewer Department, but are cleaned by the Health Department; 43 men and 14 waggons are employed upon this work. The basins near the foot of hills generally need cleaning after every heavy rain; for those on level ground once a year suffices. The material removed is taken to a dumping ground and covered with ashes. Eight thousand eight hundred loads of this matter was collected last year, at a cost of $13,000.

Privies and cesspools, five or six thousand of them, are cleaned by a contractor, under the supervision of the Board of Health, at the expense of the householders. Contractors charge from $6 to $8 per load of 80 cubic feet, and are required to use patent odorless excavators. The machines, air tight, have the air pumped out of them, and suck, the contents of the vault, for any distance up to 125 feet, through a strong hose. A small charcoal furnace, connected with the air pump, destroys any offensive gases. The work is done in the

daytime without offense. The material is either taken in scows and dumped in the sea outside the harbor, or carted into the country and buried in pits. Not one load in ten can be sold for manure. So far from its having any manurial value. the city has to pay $6 a load to have it carted away, when Peruvian guano is selling at $50 a ton.

The sewerage of Boston is good, because it is well paid for—$340,000 being paid with a population of 360,000. The appropriations are controlled by men of experience who are outside of politics.

The laborers do their work well because they are well used to it, and know that fidelity insures permanent employment and probable promotion.

1. It may be said that removal and disposal of offal is satisfactorily performed.

2. The removal of ashes, house dirt, street sweepings, and catch basin sludge, is satisfactory, but the disposal of these is not so.

3. Certain portions of city scavenging may be done by contractors, under careful and strict regulation.

CHRONIC TOBACCO INEBRIETY OR POISONING.

BY DR. A. B. ARNOLD OF BALTIMORE, M.D., PROF. OF CLINICAL DISEASES OF THE NERVOUS SYSTEM.—(From *Maryland Medical Journal.*)

There exists considerable diversity of opinion respecting the effects of the habitual use of tobacco. Exact observations on this point are still wanting. Those who deprecate even the most moderate indulgence in the weed seem to be influenced by the fact that nicotine is one of the most virulent of vegetable poisons; while others doubt the occurrence of a morbid condition resulting from this practice, because it is not readily recognizable in ordinary cases of smoking, chewing and snuffing. Although it must be admitted that in the great majority of instances these modes of using tobacco are but seldom followed by serious impairment of health, it is, on the other hand, undeniable that certain well marked symptoms arise from the continued consumption of small doses, that deserve to be designated as cases of chronic tobacco poisoning. A brief account of the results obtained by poisoning animals with nicotine, and by watching persons under the influence of dangerous doses of tobacco, will show more definitely the morbid tendencies of this noxious agent. At first there is a short stage of excitement, which is soon succeeded

by a deep depression of the nervous system, characterized sometimes by chronic and tonic spasms. This is followed by extreme relaxation of the voluntary muscles, abolition of reflex action and of electric excitability, stupor, insensibility, contraction, and finally dilatation of the pupils. The respiration is shallow, and a thoracic constriction is felt. Failure of the heart's action, preceded by a short period of cardiac excitement supervenes, and also griping or crampy pain of the bowels, frequently followed by bloody stools. These symptoms indicate serious implication of the centres of respiration and circulation, leading to paralysis, the immediate cause of death being asphyzia. The novice, when indulging in his first cigar, suffers from the effects of nicotine in a moderate degree, but in no less decided a manner; indeed, he closely presents the picture of seasickness. Nausea, giddiness, and a sensation of tightness across the chest which soon amounts to dyspnœa, and a kind of pain resembling angina pectoris are the first symptoms. Then ensue extreme pallor of the face, a cold sweat on the forehead, flickering before the eyes, singing in the ears, slight tremors, headache, colicky pains, labored respiration, a small, rapid, irregular pulse, somnolence, faintness and a feeling of general misery, or of impending dissolution. A copious flow of saliva, vomiting, and frequently free evacuations from the bowels soon give relief. The tolerence of repeated and increasing quantities of tobacco which is rapidly established is an interesting phenomenon, and explains the apparent immunity from its effects. Traube experimented with an injection containing one twenty-fourth of a drop of nicotine, and four days afterwards it required a whole drop to produce effects similar to those of the first dose. One of the most marked symptoms in these experiments was increased muscular excitability, which on larger doses developed tetanic contraction and muscular tremor. It is impossible to study the effects of nicotine upon the sensorium in animals, but there cannot be a doubt that tobacco exerts a direct influence upon the hemispheres. This is evidenced by the calming or soothing effects which small quantities produce upon the mind; and the occurrence of inebriety that may terminate in stupor and insensibility when excessive quantities are used. The vretigo and want of coördination of the voluntary muscles must be referred to disturbance of the central ganglia. The implication of the spinal cord is shown by the tremor and tonic spasms; and the interference

with the respiration and circulation proceed from the abnormal condition of the medulla oblongata. Claude Bernard has shown that the motor nerves completely lose their electric excitability when large doses of nicotine are given. . . . . From all accounts it appears that smoking is the readiest way of absorbing the largest amount of nicotine, especially if the smoke be inhaled, as is the fashion among those who use cigarettes. Chewing is not a very obnoxious mode of indulging in tobacco, for the nicotine is readily dissolved in the saliva, and thus the greater part of it is thrown out with the spittle. According to general experience, it seem that the habit of snuffing is the least injurious mode of using tobacco. The continued irritation of the nasal mucous membrane appears to cause changes in its structure which, in the course of time, prevents the entrance of nicotine into the system. Nor are there any reliable observations which would confirm the belief in the resulting noxious effects of tobacco inhalation in the preparation of its various fabrics. There certainly exists a unanimity of opinion among observers, that the prolonged and large consumption of tobacco by smoking gives rise to the unmistakable symptoms of chronic tabacco poisoning.

In a number of such published cases we find particular mention of physical disturbances, characterized by hebetude and incapability for sustained mental activity, or an exhibition of unusual timidity and pusilanimity of conduct. Opthalmological journals report instances of defects and disturbances of vision which are ascribed to the use of tobacco. Hutchinson, in his hospital reports, gives cases of amblyopia from this source which were accompanied by somnolence, vertigo, and headache. Opthalmoscopic examination detected paleness of the disk, diminished caliber of the arterial branches, and in advanced cases atrophy of the optic nerve, terminating in complete blindness. Wecker observed restoration of sight in those cases where tobacco smoking was abandoned, and asserts that the cure was assisted by strychnia in the temporal region, and the application of the interrupted current. Raymond ascribes these cases of amblyopia to the combined effects of tobacco and alcoholic stimulants. Hyperasthesia of the different sensory nerves is very common, and it is well known that tobacco smokers suffer from neuralgia. Motor disturbances of every discription have been traced to the immoderate use of tobacco, such as muscular weakness, especially in the lower

extremities, tremor, ataxic movements, and cramps in different portions of the muscular apparatus. For the past few years I myself have been much addicted to smoking, which brought in its train a variety of symptoms of a very unpleasant character. In my case, the effects of tobacco were apt to be felt more particularly when lying down to sleep, consisting of the most part in increased action of the heart, throbbing of the temporal arteries, and flushes of heat over the head and face. But the most troublesome symptom, which fortunately made its appearance not quite so often, was a choking sensation of an alarming character, though only of a moment's duration. Probably it was caused by spasm of the glottis. Occasionally I was startled, just when drowsiness came over me, by a sensation as if some one had given me a hard slap upon the side of the head. At longer intervals I suffered in the morning, while yet in bed, from cramps of the calf of the right leg and in the sole of the foot on the same side. Stretching of the limb, I found, favored the occurrence of these local spasms. Distention of the stomach with flatus was another annoying symptom, to which I ascribed the dyspnœa from which I suffered much. It seemed to me that eructations, which I learned to bring on at any time, very frequently prevented the occurrence of some of the symptoms I have mentioned, especially the sudden onset of the choking sensation. Perhaps the latter phenomenon is a reflex action from gastric irritation. My appetite has never suffered, though I discharge quite a quantity of saliva during the act of smoking. The best reason I can assign for my belief that these symptoms were caused by tobacco, is the fact that on abandoning its use I was free from them. Lately I began to smoke cigarettes for the purpose of limiting the quantity of tobacco used; the evil effects of my previous immoderate indulgence are thereby not lessened, which warns me to abandon the habit entirely. The depressing effect of the inordinate use of tobacco upon the generative function is an old observation; indeed, it was considered the best antiphrodisiac remedy in the Italian convents of a past age. Wright, Clemens, and Fousgard recently reported cases of impotency caused by the excessive use of tobacco. The latter authority describes a very annoying species of dyspnœa, generally occurring in the evening, which is not an infrequent effect of smoking. All accounts agree that disturbances of the heart's action is the most common of all symptoms in chronic tobacco poisoning. Richardson

affirms that it aggravates the intermittence of the pulse which results from cardiac troubles. Retardation of the pulse under the influence of tobacco is probably due to its depressing effects upon the general nervous system. Angina pectoris may also be counted among the occasional effects of tobacco. Colicky pains, and sometimes violent cramps of the intestines, may be traced to the same cause. The popular belief that use of tobacco leads to dyspepsia does not seem to be well founded; at least in carefully observed cases of chronic tobacco poisoning, indigestion has not been noticed as one of its characteristic features. Chronic laryngitis is mostly observed among cigarette smokers, and is probably due to the inhalation of the fumes. The question whether the use of the tobacco-pipe may cause cancer of the lips and tongue has been again discussed by eminent surgeons. In view of the relative infrqeuency of this affection, which often locates itself in other parts than the mouth, and further, as persons suffer from cancer of the lips and tongue who never use tobacco, other factors must be presumed to co-operate in the production of the disease, although the existence of fissures and sores on the lips would commend total abstinence. Recent investigations respecting the chemical constituents of tobacco fumes confirm the older view of the presence of nicotine. It has, however, been ascertained that nicotine appears mostly in the form of salts, having picoline for their base. Other substances of a similar composition are generated in the act of smoking, which seem to form under the influence of the varying quantity of water in the tobacco and its mode of combustion. Thus the use of the pipe developes the highly diffusible and narcotic pyridin, while cigar smoking gives rise to larger quantities of colidin. There exists only one remedy for the cure of chronic tobacco poisoning, but this is so prompt and efficacious that none other is needed. Unfortunately there exists also a very great and frequently an insurmountable prejudice among smokers against its employment. It is the abstinence from tobacco.

A TEST OF CIVILISATION.—An exchange says that "according to a writer in the Chicago *Pharmacist*," the United States Government applied for information as to the number of patent medicines and the extent to which they were sold in Germany; and in reply were politely told that as Germany was now a civilised country patent medicines had no existence in it!

CAN FILTH PRODUCE DIPHTHERIA.

The following instance, from *Good Health*, reported by Dr. Griffin, president of the Winsconsin State Board of Health, is illustrative as to the frequent origin of this disease. A German owned a farm which he rented, situated a few miles from the village in which he resided. The cellar of the house and its surroundings were in an exceedingly insanitary condition, the natural result of which was an outbreak of diphtheria in the family of the tenant. After several deaths, the family left the house and another tenant occupied it. In a short time the disease appeared again, with a like result, several deaths and the desertion of the house. As there had been no diphtheria in the neighborhood, and no communication with other places where the disease existed, it appeared to be very evident that the disease originated in the house and its unclean surroundings. The physicians of the neighborhood accordingly very properly condemned the house and warned people against occupying it unless the evils existing should be corrected. The owner of the property was much exasperated at this, and contended very strongly that the doctors had a grudge against him and had conspired to injure him. He jeered at the idea that any insanitary conditions about the house had anything whatever to do with the sickness and deaths in the families of his tenants; and, at last, to prove the falsity of the claims of the physicians, he moved his own family into the house. Within a week or two several of his children were sick with the same dread malady, and in a very short time he buried nearly all his numerous family of children. He was now convinced, but too late to save his children who had been sacrificed to his foolhardy ignorance.

All persons who will continue to neglect to observe the necessary precautions to avoid the disease, and to prevent its spontaneous origination from filth, become equally culpable with the Dutchman for loss of life which may follow their carelessness or temerity.

Dr. J. W. Macdonald, of Londonderry, Nova Scotia, has collected and had published in the Halifax *Chronicle* the following facts, which seems to answer pretty conclusively, the question heading this article.

Six deaths occurred in a family at Newport, R.I., from malignant diphtheria. The cottage was healthfully situated, with a cellar under all of the main portion, but not under a small edition, one story high, outside the main building. This contained a sink and water-

closet, and was only separated from the main house by a thin board partition. The sink had an imperfect trap, and this and the water-closit emptied into a cesspool which had not been cleaned for several years. A pipe from the water-closet leaked, and allowed leakage into about a square yard or more.

Dr. Bingay, writing in the Annapolis *Journal* of June 1st, 1878, says :—

"I have lately had occasion to pass through several of the back premises of this town, and say the condition of many of them was simply abominable. The same is the case with the roadside ditches in the neighborhood of the railway station. The owner of the premises on the highest ground drains on to his neighbor, and so on, till it all accumulates at the lowest point, where it remains, without an outlet, to poison the village with its reeking stench."

* * * * * *

"Already the disease in this vicinity are taking on a low or typhoid type—that is, those suffering from a cold, etc., find that it is difficult to get rid of it and recover their usual health. Fever has been unusually prevalent and severe. Sore throats have, in many cases, so nearly simulated diphtheria that the firmness of the membrane alone distinguishes them—all showing that we are already at a low ebb in physical vitality and fit subjects for a fatal visitation from any epidemic that may come upon us.

6. In another part of Annapolis County live a family consisting of a man, his wife and nine children. For two years their medical attendant was scarcely out of the house for a fortnight at a time. They had diphtheria, typhoid and other diseases, and their general mortality was always low. The kitchen waste waters and other slop were thrown out at one of the porch doors, whence they soaked into the ground and went under the house, causing an offensive smell. Convinced that this was the cause of so much ill health, the doctor induced the man to clean out his cellar, throw the slops into a trough which carried them about thirty feet away, dig out the saturated filthy soil and put fresh earth in its place. Their health speedily improved, and since then, more than a year ago, they have never had to send for a medical man. The physician to whom I am indebted for these notes states that when he finds zymotic diseases of various kinds in one house he always also finds bad sanitary conditions.

In the County of Yarmouth an old barn was gutted. The floor and sleepers were taken up and a large quantity of the earth beneath them was dug out and placed in a heap near the house. This heap had a most offensive smell. A few days afterwards five persons in the house took diphtheria, three of the cases being of a very malignant type. The father, mother and three children were attacked, the mother and two children died. This family was not exposed to infection.

In the County of Lunenburg is a house which stands upon a very dry hill, apparently a most healthy locality. Every member of the family living in this house unexpectedly took diphtheria and four died out of five. There was no conceivable way in which they could have taken the disease by contagion. Through the kitchen wall passed a wooden spout which carried the slops from the sink and allowed them to fall upon several cartloads of mud, straw and moss, heaped up against the wall. To this filthy compost the doctor felt convinced the diphtheria owed its origin. Several medical men in large practice have told me that they have frequently found that this method of making a compost produced typhoid and diphtheria.

In a very thinly settled district of Lunenburg County lived a man who was most careful about diphtheria, and who never allowed his children to go to the town lest they should be exposed to the infection. In spite of his care, however, one of his children took diphtheria and died. The doctor was at first puzzled as to the origin, but on examining the sink it was found that the water ran down the wall, soaked through it, and got into the cellar. It is a pity this poor man's care to avoid infection was all in vain, but unfortunately he was not aware that sanitation, like charity, must begin at home. A number of people attended the funeral of this child, nearly every one of them took the disease home to their families, and thus another slaughter of the innocents was added to the long list of epidemics resulting from ignorance and carelessness combined.

A young man engaged in fishing, slept in a fish house, or shed, which was filled with a horrible stench of fish refuse and fecal matter. He was taken home, suffering from diphtheria, and in a short time he died. All the rest of the family except the father took it from him, and it spread through the neighborhood. It was observed that the families living at a lobster factory were the greatest

sufferers in this epidemic. In one of these families, seven out of eight persons died; in the second, two out of four; and in the third, two out of four.

The next case I shall mention was an outbreak of diphtheria, in a house standing alone, on high and apparently healthy ground. The disease broke out most unexpectedly, and two children died, out of five attacked. Seven feet from the back door was a compost of decomposing fish, lobsters and earth. The cellar had not been cleaned out for twelve years, and the stones in its walls were covered with mould.

At Osborne, near Lockport, large quantities of lobster refuse are used as manure upon the fields. Twenty years ago, it is said, a man brought diphtheria to the place, and it can scarcely be said to have ever left the place since then.

HOUSE BUILDING—FIRE-PROOF BUILDINGS FOR WORKING-MEN.

The great conflagration in Chicago in 1871 was the cause of a strong impetus given to improved and better fire-proof buildings than thus far had been erected. The first act was the passage of a law prohibiting the erection of wooden buildings within the city limits; the second was a step taken by the managers of various savings-banks who wished to utilize at once the large number of lots which had been bought by them, after having been cleared of its buildings by the great conflagration. This step was an invitation to architects to submit plans for a dwelling of not less than five rooms and a capacity of not less than 5500 cubic feet, and of a store and dwelling combined, to contain not less than 30,000 cubic feet of space. It was an indispensible condition that the buildings should be as nearly fire-proof as possible.

An able committee selected examined the various plans received, and awarded a prize of $1000 to A. J. Smith, architect, of Chicago, for his schemes for a one-story house, 20 by 43, to cost $1200; a two-story, 18 by 26, to cost $1700; and a two-story dwelling and store combined, 22 by 59, to cost $3600.

The one-story buildings contain five rooms each, consisting of a parlor, 13 by 12; a dining-room 13 feet 6 inches by 10 feet 6 inches; a kitchen, 10 by 10 feet 6 inches, and two bedrooms, 10 by 6 feet 6 inches. The height of each room is 10 feet in the clear between

the floor and ceiling. In the two-story buildings there are also five rooms—a parlor and kitchen on the first and three bedrooms on the second floor. The first floor is 10 feet high in the clear, the second 6, and the cellar 6. The total cost of this building is only $1700, notwithstanding it is very nearly fire-proof—at least far more so than the most costly ordinary dwelling-houses.

The way in which this has been secured is, with the other details, as follows:

The exterior walls are hollow, one being eight inches thick, the other four, with a space of three inches between, wrought-iron bolts being used to tie the shells. All rafters and floor-beams are protected from above and below by artificial stone plastering one and a half inches deep. No wooden lathing or furring is permitted. This plastering, which is the fire-proof material, is applied very simply. A twelve-penny nail is driven into the bottom of the joist (less, say, three quarters of an inch) every three or four inches. An endless strand of wire is then wound once around the head of a nail, and is passed from one to another, a hitch being taken on each. A movable platform, the top surface of which is one and a quarter inches from the lower line of the ceiling joist, is brought into use, and the plastering is then deposited upon the platform from the top of the joist to the depth of two inches. As soon as the plaster sets the platform is lowered, moved along and readjusted for another stretch. By arranging the wires half an inch apart, the plaster can be put on from the under side in the usual manner, and has been known to dry sufficiently in half an hour to bear the weight of a heavy man; it is composed of one half cinders, crushed furnace-slag or bricks; one-fourth ordinary plastering hair mortar, and one fourth coarse, strong plaster of Paris. Where the platform is used, all the plastering required from the under side is the hard-finish.

Some most important features required by the Chicago building committee were, that the partitions should be of brick; that all beams and rafters be protected by the concrete described; that all smoke-flues shall be built in the walls, of burnt earthenware pipe; that all plastering be done directly on brick or stone; that the cornices be of brick; the window-caps and door-sills of stone or marble, and the roofs of slate or tin laid on a bed of concrete.

In regard to ventilation, this is provided for by flues adjoining the smoke-flues and topped out in the chimney. There is an air-space

beneath the ground floor, preventing dampness arising from the cellar or ground, and another between the ceiling and the roof, which guards the rooms from over-heating in summer. Each house is furnished with a bath-room and facliities for thorough drainage.

This style of building has been severely tested, and is known to have resisted a vast degree of heat and flame. In ordinary fires the plastering will prevent the flames spreading from one room or floor to another.

These buildings, when ready, were sold, and the terms were that ten per cent of the appraised value should be paid at the time of purchase, a mortgage for one half the entire amount given, and the balance could be liquidated in monthly instalments, the purchaser also having the privilege of paying off the mortgage whenever convenient to himself.

A large number of buildings constructed upon these plans were erected on Sacramento Avenue, near the Central Park; and the leading builders of Chicago have adopted the peculiar features of the plans which we have explained in the erection of more costly dwellings.—*Practical American.*

A PENNY DINNER.

Mr. Ernest Hart writes:—(*Sanitary Record*) 'Many will, we think, be interested to read the following *menu* of a dinner party recently given with the view of demonstrating the practical character of the opinions expressed by the 'Doctor in the Kitchen' as to the possibility of combining economy in material with a certain degree of gastronomic refinement and fully adequate nutrition. The party numbered ten, and included some ladies and gentlemen prominent in professional and literary circles. It was understood that the dinner should consist of eight courses, and that the total expenditure for material for each individual should not exceed a penny for each course. The *menu* consisted of potage croûte au pot, harengs frais grillés, sauce moutarde; œufs au kari, homard en escallopes, bœuf à la maitre d'hôtel, haricots, blancs sautès, navets glacèe au jus, mince pies, glaces à la vanille. The following was the cost of materials:—Ox cheek, 1s. 2d.; vegetables, 3½d.; cabbage, 1d.; parsely, etc., 4½d.; 10 fresh herrings, 6d.; butter, etc., 2½d.; eggs, 6d.; rice, curry, etc., 4½d.; turnips, 6d.; butter and sugar, 3½d.; mincemeat, 6d.; flour and butter, 4d.

Cream ice—milk, 2½d ; eggs, 4d. ; ice and salt for freezing, 4½d. 11d. It will be seen that the cost did not exceed eighty pence for the ten guests, or eightpence each for the whole dinner of eight courses. The drinks consisted of lemonade made with fresh lemons for abstainers, but no attempt was made to put a limit on the cost of wines for those who chose to indulge in them. Dessert also was treated as purely a luxury, and the cost was not included. The dinner was declared by all the guests to be a thorough culinary and gastronomic success. There was not one dish which might not have been served by the most fastidious Amphytrion. It was, of course, on this occasion served with all the suitable refinements of a dinner party, and perhaps the general judgment is best summed up in the words of one lady, who said :—' Well, all I can say is, that it only differs from any other of the best dinner parties of the year, in that, on the whole everything was nice, and it is, perhaps, the best dinner I have had this year.' This, was of course, rather an enthusiastic utterance. On the other hand, the judgment of cool critics may be taken as a voucher that this " penny dinner " was in every sense satisfactory ; and that it at least demonstrated the possibility of utilising various simple materials, and of constructing a refined, agreeable, and nutritious repast, on a very economical basis. For this purpose good culinary skill, and some amount of thought are necessary, but it is intended to prove by a series of other dinners of the same kind, that the list from which such *menus* may be constructed is by no means a very limited one. The price chosen was arbitrary and extreme, with the simple view of pointing more clearly the moral which such a *menu* is calculated to convey as to prevalent ' extravagance in eating.' Of course, there is no reason why the cost should not be trebled or quadrupled, and yet a useful lesson be learned. It is only necessary to add, that everything was bought in the shops of the neighborhood and in the ordinary market, and no attempt was made to secure extraordinary bargains for the occasion, although, of course, economy was rigidly consulted throughout. The soup especially, which was made from the strong meat stock obtained from the preliminary preparation of the ox cheek, were pronounced to be singularly good, and the haricots blancs, cooked in a Warrener pot and served with the beef, were *chef d'œuvre* of tenderness and excellent flavour. Vegetables are dear now, but the carrots glacés, as prepared with old carrots carefully steamed, glacès, and sautès, were pronounced delicious.'

THE REDEMPTION OF MEMPHIS.

The redemption of Memphis is an earnest of the near future, inasmuch as the people of that city and the legislature of Tennessee have determined upon the execution of the sanitary work recommended by experts under the auspices of the National Board of Health, which, in brief, comprehends the systematic ventilation and chilling of all the houses in the city, and especially the thorough cleansing and ventilation of all cellars and yards; discontinuance, cleaning out, and filling up with clean earth all privy-vaults; the immediate disuse of polluted water; the disinfection, or destruction by fire of all fomaties of whatever nature; cleansing and utilizing the bayous as means of facilitating surface drainage; the removal and destruction of all surface filth, including rotton wood pavements; the provision of pure water supply; sewerage, subsoil and surface drainage, and impervious pavements.

Roused to a full sense of the importance of the work, notwithstanding the impoverishment to which they were reduced by the ravages of an epidemic of yellow fever of almost unprecedented fatality, so great is the faith of the people of Memphis in the recommendations of sanitarians, that they have asked and obtained the privilege of imposing a special tax of two per cent. on all their taxable property, in order to raise the means necessary to carry those recommendations into effect. The progress and result of this work will be watched with eager interest by sanitarians all over the world, for it puts to the test the influence of local sanitation on a disease, which is said by some who profess to much knowledge on the subject, to bid defiance to all local conditions. For ourselves, it seems hardly necessary to say, we anticipate a complete refutation of all such views.

Another summer's observation of the conditions common to yellow fever in this country, have fortified us in the conclusions we have heretofore frequently found occasion to express, that the conditions of yellow fever are, in general, putrefying organic matter, moisture and high temperature; and wherever these three factors combine in the greatest degree of completeness within certain geographical limitations, there yellow fever is most likely to arise or may be introduced with the greatest facility, as is most wont to prevail. And of all the means at our command for preventing or disarming

yellow fever, cleanliness is the most potential and the most enduring, and most of all applicable to vessels in communication with places where the fever prevails.—*Sanitarian.*

THE CAUSE AND CURE OF CONSUMPTION.

Dr. E. Q. Norton, of Cleveland, in the *Virginia Medical Monthly, (Michigan Medical News)* October, 1879, having suffered from consumption gives a report of the methods he adopted to secure relief. It would seem all methods—regular, irregular and defective, such as the best and worst medical advice, proprietary medicines and specifics climate and travel—were tried without benefit. At length when in a deplorable condition, the Salisbury method of diet was tried and resulted in cure. Quite a number of illustrative cases are given at the close of the article.

Dr. Norton claims that consumption (phthisis pulmonalis) is not hereditary further than the probable similarity of diet and habits may favor the development of the disease. Children of consumptive parents by proper diet are not more liable to phthisis than others, while the offspring of the most healthy may easily acquire the disease by eating "exclusively or too freely of food now known to cause it." When the disease is developed, reasonable hopes of recovery may be entertained in all cases in which there exists no organic lesion—no absolute breaking down of some vitally important organ of the body.

Consumption, he claims is caused by a yeast or fungoid growth, easily detected in the blood by the microscope long before the ordinary symptoms or physical examination would lead us to suspect the disease. This fungoid, if such we may term it, is nourished by fermentation, and, therefore, all articles of food which are susceptible of fermentation, vegetables, fruits, vinegar, etc., should be discarded or used in very limited quantities, for this fungoid can not continue to develop when fermentation ceases.

This theory of the cause suggests the "Method of Cure." The patient must be restricted to a meat diet. One mouthful of bread or boiled rice to six of meat, and a cup of tea or coffee, without sugar or milk, may be permitted. Not less than an hour before each meal and at bed-time the patient should drink one half pint of hot water. This is to wash out the stomach and bowels and remove the yeast that may be in them. It is an excellent apetizer and does more

good than medicines. On retiring take a hot-water bath containing a tablespoonful of ammonia, and finish with brisk rubbing. The meat diet may not be very pleasant at first, but in a few days the patient becomes accustomed to it and rather relishes his new mode of life. It is well to have the supervision of a competent physician to direct the amount of exercise, recreation, etc., and to strengthen weak resolutions in those who have not perseverance to continue the treatment alone.

INFLUENCE OF MARRIAGE UPON HEALTH AND MORALITY.

Dr. Bertillon, a French savant, has published some very interesting statistics in regard to the influence of marriage upon the human race. He has studied the mortality bills of every country in Europe, so that his figures are more exhaustive and his conclusions more striking than any previously published.

He finds that "a bachelor of twenty-five is not a better life than a married man of forty-five; that among widowers of from twenty-five to thirty the rate of mortality is as great as among married men of from fifty-five to sixty." In other words, celibacy ages a young man at least twenty years, and widowerhood still more. In France the rate of mortality among married men, between twenty and twenty-five years of age, is ten per thousand, and among bachelors of that age sixteen per thousand, and among widowers nineteen per thousand.

In regard to criminal acts, these occur about 50 per cent. oftener among bachelors than married men, and 25 per cent. oftener among spinsters than married woman. Suicide is also much less frequent among the married. In fact, all the statistics show very conclusively that the married state promotes health, long life and morality.—*Lancet.*

More persons die, the *Engineer* observes, of zymotic diseases in New York than from almost any other malady, yet a man living in the midst of contagious influences, and hence daily liable to take diphtheria or typhoid fever, would find little trouble in getting a heavy policy on his life. If insurance officers would give this subject their attention they might save many losses to their companies, and also benefit the public generally; for if men found that their homes were rated as "hazardous," they would soon begin to think of finding a remedy for the difficulty.

WARMING AND VENTILATING.

Dr. John Drysdale (*Medical Press*, Dec. 10, 1879) describes a new method for warming and ventilating homes. Its main essentials are as follows: The suction power for efficient ventilation must be sufficient to empty the whole house every twenty or thirty minutes; it must be automatic or self-acting; it must abstract from every room equally; it must be inexpensive; the fresh air must enter each room in sufficient quantity to fill the room every twenty or thirty minutes, and it must enter imperceptibly and at a temperature less than 60° F.; it must, therefore, enter the house by a special opening and be warmed as it enters in some central or separate lobby, hall or other reservoir. These conditions have all been met in the construction of Dr. Drysdale's house at Liverpool, and in those of several other medical gentlemen. As they have stood the test of practical experience for several years the plan is worthy of consideration. To apply these principles it is necessary that the waste heat of the kitchen fire be utilized as the suction power, because this is the only fire that is lighted daily throughout the year, no other means being costless and automatic. To enable this suction power to operate upon all rooms equally at the same time, there is a central or intermediate chamber or drum into which all the exit flues terminate at the same level, and from which one single flue leads into the up cast. The cost is practically nothing after the flues are once arranged.—*Detroit Lancet.*

DISINFECTION BY ACIDS.—At a recent meeting of the Glasgow Philosophical Society, Dr. Fergus in the chair, Dr. John Dougall read a paper on 'Disinfection by Acids.' Of late years, he said, perhaps no material had been so largely used in disinfection as carbolic acid. Experiments had led him to the conclusion that carbolic acid was not a disinfectant, not a destroyer of organic matter, but rather an antiseptic—a preserver of organic matter. Acids were prompt and efficient zymotics. Disinfection by acids was far from new. They were used by the Greeks to fumigate their temples after sacrificial rites, and also to destroy the parasites which infested their sheep. Acetic acid had been long used as a disinfectant. Its reputation as such was said to have arisen from the confession of four thieves who, during the plague of Paris, plundered the dead bodies with perfect security, and who, on being arrested, stated, on condition of their lives being spared, that the use of aromatic vinegar had preserved them from the influence of contagion. His experience and observation had convinced him that disinfection by acids was cheap, quick,

easy, and certain, and he had been frequently struck with the summary manner in which an infectious disease had been thus averted under circumstances most favourable to its propagation. For disinfection he advised the use of three acids—hydrochloric, sulphurous, and aromatic glacial acetic acid.

THE GERMS FLOATING IN THE ATMOSPHERE.—An elaborate series of experiments has been undertaken by M. E. C. Hansen, at the Carlsberg Laboratory, with the object of identifying the various organisms which float about in the atmosphere, and which are found in worts and beer. These investigations form a valuable addition to those of Pasteur and Tyndall, who have already placed on record the results of their experiments in the same direction. It has been observed that the germs of yeast proper are very seldom met with in the atmosphere, but an infinite variety of moulds abound in almost all parts. Pasteur found that besides moulds and bacteria, he occasionally met with the following organisms: *Mucor racemosus*, *Saccharomyces mycoderma*, *S. pastorianus*, *S. ellipsoideus*, *S. apiculatus*, *S. cerevisiæ*, and bacteria, producing butyric and lactic acids. M. Hansen found in his experiments that saccharomyces are very seldom met with in the atmosphere; bacteria are usually present, but they are not nearly so plentiful as the various moulds, among which *Penicillium glaucum* is the most common. In very cold weather it was noticed that all varieties of saccharomyces disappeared, but even then moulds and certain forms of micro-bacteria were to be met with.—*Scientific American.*

FOOD AND HEALTH:—Dr. B. N. Richardson in his description of the ideal healthy people of "Salutland," says.—The second of the final advancements had relation to food and feeding. The physiologists, dealing with the two questions of digestion and food for digestion, were led to the conclusion that a considerable shortening of life was induced by the excess of work which was put on the digestive organs. They bore in mind a fact which I have already mentioned, that many persons die from the wearing out of one particular organ, the rest of the organs being still healthy. Of all organs, they agreed the stomach is most exposed to this danger. It is so much more worked in comparison with other organs, that it must be the first to die, unless the uses to which it is put be wisely directed. They found on inquiry, that the truth was as they suspected it to be, and that the stomach was distressed both by quantity and quality of food. The result of the research led to quite a social revolution. Following a suggestion thrown out by Flourens they decided, on anatomical grounds, that man was neither herbivorous nor carnivorous, but a frugivorous, or fruit-eating animal.

DISINFECTION VS. CLEANLINESS.—In the use of disinfectants or deodorizers, we should never be allowed to forget the more important need of cleanliness. It is a vastly better and more efficient way to *remove* the cause of trouble rather than to attempt to control its action by an antidote. It was the style one or two centuries ago for ladies and gentlemen to use perfumes in great abundance on the person as an antidote to conceal the emanations, which were, in a more advanced state of civilization, found to be readily avoided by a more frequent change of underclothing. The costliness of linen and the entire absence of cotton cloth in those days rendered it comparatively difficult for any but the more wealthy to indulge in these frequent changes which are now thought so necessary to comfort and health. It was for this reason that Beau Brummel and his cotemporaries had recourse to perfumery where we now use the laundry. It would be a great mistake and a retrograde in civilization to suppose that any application of chemicals could compensate for the lack of hot water and soap all about the insides of our houses, at frequent intervals, or the frequent exposure of our apartments to sunshine and fresh air.—*Extract from Edw. S. Philbrick's series, entitled "Domestic Sanitarian, in the October 1st issue of The Sanitary Engineer.*

INFANT FEEDING.—In a work on Infant feeding and causes and prevention of Infant mortality, etc., by Dr. Routh, the author writes as follows: "For the first two months of infancy it may be wise to give them their food every two hours. As soon, however, as it can be done, the child should be taught to suckle or feed at regular hours —every three or four hours—and then to sleep, if need be, after it. But I am a very great advocate for teaching a child another good habit, and that is to take its food four times in the day, but once only at night. It is better for both mother and child. It gives the child an opportunity of having a longer night's rest, and affords the stomach also a longer period of rest. It is certainly more healthful for a suckling mother, because she sleeps better, and besides it makes a nurse more contented. A little firm management will suffice for this. It only needs to be gradually done. Otherwise, babies are very apt to get into the bad habit of sleeping all day and waking all night, to the immense annoyance of nurses as well as parents.'

EDUCATION OF THE YOUNG:—B. W. Richardson says of education in childhood: "Under seven years all teaching should naturally be conveyed through play, if the body is to be trained up healthily as the bearer of the mind. * * Thus letters of language can be taught; conversions in different languages can be carried on; forms of animal life can be classified, the surfaces on the earth can be made clear, history can be told as a story, etc., etc." Thus the child, free to learn, learns well, and eats and sleeps and plays well.

THE HYGIENE OF THE SCHOOL ROOM IN ITS RELATION TO SIGHT.

At a late meeting of the Société de Biologie (*Gazette Hebdomadaire*, Oct. 17, 1879) Dr. Javal, Director of the Laboratory of Ophthalmogy at the Sorbonne, read an interesting paper on this subject and summarized his views in the following conclusions :—*Medical News and Abstract.*

1. It is proved that the causes of short-sightedness are habitually a prolonged application of sight during childhood combined with insufficient light.

2. In our climate illumination by diffused light never attains, even in the open air, to an injurious intensity.

3. The belief that bilateral light is injurious to the preservation of sight does not rest on any theoretical basis.

4. According to most recent statistics there are schools in which the light being bilateral, myopia is comparatively rare, and there exist others in which unilateral light is had under most favourable conditions, nevertheless myopia is as frequent as in the worst arranged schools. Experience is certainly not in favour of unilateral light.

5. Sufficient light by means of windows arranged on one side can only be obtained if the width of the room does not exceed the height of the lintels of the windows above the floor.

6. Light from behind, if it comes from above, may he usefully combined with lateral light ; the light from a glazed roof is excellent.

7. Bilateral light should be preferred on all accounts. In this system, the width of the schoolroom being for the same height of windows twice as great as in the case of unilateral light, the intensity of the light in the middle of the room, which is the least benefited portion, is double that obtained by the same distance from windows where unilateral light is used. However, the width of the schoolroom must never exceed double the height of the windows.

8. Great importance must be attached to placing the school towards the east, and the axis should be directed from north-northeast, to south-southwest ; a deviation of more than 40 degrees from the direction north-south should never be allowed except in exceptional climatic conditions.

9. The master should face the south.

10. Finally it is absolutely indispensable to reserve on every side of the school-room a strip of inalienable ground, of which the width

should be double the height of the loftiest buildings that could be erected; allowing for the progress of civilization which has multiplied high storied buildings to an extent hitherto unknown in the country. *This last condition is the most important of all.*

VACCINATION AND REGISTRATION OF DISEASE.

Information has reached us of a very serious outbreak of typhus fever at Jarrow, which has already attacked some seventy persons, and threatens to become more extensive. The regulation that is in force in the borough, requiring medical practitioners to forward to the Sanitary Authority information of cases of infectious disease, has enabled the Medical Officer of Health to trace with great certainty the course of the disease, and the origin of the various attacks. There seems to be little doubt that this regulation has been the means of saving the town from a wide-spread epidemic of the disease. In houses where ordinary sanitary precautions were possible, they have been from the first enforced, and the infection has never spread. But the disease cannot be so easily stamped out, in the lowest and most crowded quarters, in the absence of the infectious hospital that has so long been under consideration, and is still being haggled about. But even there, in spite of difficulties, the spread of the disease would appear to have been greatly checked. A striking proof of the ease with which the epidemic might have been avoided, if the borough had had a hospital, is afforded by the fact that nearly all of some sixty to seventy cases can be traced distinctly to one first case, which might and which ought to have been removed. One case, in particular, points a moral in this connexion.

THE NATURE OF FUR ON THE TONGUE.—An English scientist has recently been investigating the nature of the 'fur' or coating which appears on the tongue in certain diseases and morbid conditions. Microscopical examination showed that the coating consists of (1) Remains of food and bubbles of saliva and mucus; (2) Epithelial cells from the mucous membrane; (3) Vegetable growths of the nature of fungi, of which several varieties are usually present, among which are *micrococcus* and *Baterium termo*, two species of germs which are very commonly found in great abundance in cases of diphtheria.

Editorial.

NO "SANITARY REFORM" THIS YEAR, AND WHY?

Many were the expressions of disappointment and regret we heard after it was announced in the House a few weeks ago by the Attorney-General, in reply to a question from Dr. Robertson, M.P.P. for Halton, that it was not the intention of the Government to introduce any measure this session of the Legislature for improving the public health. It had been believed by many throughout the Province, that after what had taken place at the two previous sessions, the Government fully intended to take some action this year in this way.

It appears the Government think there is not yet sufficient public interest taken in this question to warrant any special action and the appropriation of much money for the purpose. But are the public in Ontario so far behind in this matter, in their appreciation of health, the people of other countries and even their "next-door" neighbors? As we stated in our last issue, in almost every civilized country there is now some central organization, in connection with the Government, for looking after the public health.

We are in a position to know something about the interest felt in this matter, and we are fully persuaded there is a deeply felt interest in it amongst the more intelligent classes, who alone can be supposed to understand and appreciate its value. And it is a very general opinion amongst such classes, that work in this matter which so deeply concerns every individual, should not be left so much to individual effort, but should be taken up by the Government. It is true, those who feel much interest in this question of public health have not been so demonstrative as to clamor for sanitary reform; but the interest is felt nevertheless.

HOW SOME OF IT IS SHOWN.

We have received many letters from prominent gentlemen in different sections of the Province, strongly sympathizing with our efforts in this direction, and especially referring to the indebtedness of the public to this Journal for the awakening it has created in the Province in this Sanitary question. And furthermore, when just about the time of meeting of the Legislature, it was feared by the few in Toronto who were acting in the matter, that the Government would

not take any action this session, efforts were made to have petitions circulated and sent in in favor of it, many were readily found in different sections of the Province ready to circulate these and obtain the names of the most prominent citizens. But by the time this work had been fairly commenced the Attorney-General publicly announced that there would be no legislation this year. As it was, a good many petitions came in, signed by many amongst the most prominent representative men in the Province. And had this move been made a few weeks or months earlier, petitions would have come in from nearly every municipality in the Province. But the fact is, it had not been thought to be necessary.

Certainly we shall not slacken our efforts in this behalf until some permanent and efficient means is taken by the Government to systematically combat disease in every practical way; and we trust every one who feels an interest in the future welfare of the people of this Province will aid us in our efforts.

The *Canada Lancet*, in referring to the question of "Sanitary Reform" (two good words), observes,—"No intelligent person will "deny the necessity for legislation regarding this matter, and we feel "assured that the Government would not only have been able to pass "such a measure without opposition, but it would have received the "approval of the public generally. We are glad to say, however, that "there is a great probability of the Dominion Government taking "some action in the matter. Last session a measure was introduced "for the better collection of vital statistics, and we understand that it "is proposed to pass an Act, having this end in view, during the "ensuing session."

It appears, however, that it has been decided that, while the Dominion Government may of course use means to educate the public in health matters and collect statistical information, the province of enforcing measures relating to these subjects rests with the local Legislatures. It is unquestionably much better that the enforcing of sanitary measures and the education of the public should go hand in hand together.

In Reference to Life Insurance examinations the *Sanitary Engineer*, May, 1879, very properly asks: Instead of merely hammering at a man's chest to find if he has a tendency to any disease, would it not be well for the medical examiners of life insurance companies to inquire if he has a cesspool leaking into his well, or untrapped pipes beneath his basins and closets?

THE PROPOSED PROVINCIAL BOARD OF HEALTH.

Since our last issue, as most of our readers are doubtless aware, an influential deputation waited upon the Attorney-General of Ontario, for the purpose of urging upon the Government the necessity for establishing, during this session, a Provincial board or sub-department of health, for promoting or improving the public health in this Province, especially for educating the people in matters pertaining to health, and to aid in preventing the spread of contagious and infectious diseases.

The deputation consisted of Drs. Covernton, Fulton, Canniff, Oldright, Ogden and Playter, the Mayor of Toronto, Mr. John Leys and Mr. Thomas Monk. Several other influential gentlemen were to have formed a part of the deputation, but were not able to attend at the hour appointed.

The draft of a Bill prepared by a committee was presented, in which the duties of the proposed board were suggested. The principal provisions were as follows—A board, to be composed of seven members appointed by the Lieutenant-Governor in Council, and a health officer, who with two members of the Governmeut should be *ex-officio* members of the same, was to be invested with the power of obtaining information from local boards throughout the Province, in reference to the existence of infectious diseases, and to adopt prompt measures for the stamping out of such diseases, so as to prevent an increase in sickness or mortality. A secretary was to be appointed by the board to compile and arrange the vital statistics and health reports, for discussion and publication, and to issue such regulations regarding the prevention of disease as might be approved of. One important feature was the advisory character of the board with reference to the necessary legislation for enforcing sanitary measures for the protection of the public health, as well as the education of the public regarding sanitary reform generally, and for having an efficient and active local board organized in every municipality in the Province, in accordance with our present public health Act. An annual appropriation of $5,000 was asked for to enable the desired objects to be carried out.

The Bill differed but little from those which have been sanctioned in so many of the States of the adjoining Republic. The deputation advanced statistics to show how beneficial the action of such boards had been. Wherever they had been in operation for a reasonable

length of time, the death-rate had been considerably reduced, especially from preventible causes. The beneficial effects of isolation hospitals was alluded to, and instances were given in which large numbers of lives had been saved by this means. The saving to the country from the enforcing of sanitary regulations was also brought forward as an additional inducement to urge the Government to grant an appropriation to aid in promoting the public welfare.

THE "BACK YARD."

Too often this private sanctuary, as too many regard it (we hardly know why), is little better than a small stagnant pond or marsh, so far as regards a source of malaria or cause of sickness. This, in both town and country. Slop waters of various sorts are thrown out upon the surface of the ground and soak into it. The soil is but rarely underdrained, and becomes sodden and a perfect hot-bed for the growth of the lowest forms of vegetable, microscopic plants, moulds, mildews, fungi, bacilli, &c., may of which are but seeds of disease. That dread disease diphtheria, it is believed may arise from such a source, as do diarrhœa and erysipelas; and especially general poor health—impure blood and other bodily fluids.

Why have a "back yard" in the ordinary sense of the term, at all? Why not have the yard at the back of the house well sodded with velvety grass and dotted with flower beds, as the yard in front not unfrequently is. This completely around the house. All slops should be CARRIED or conveyed in a PERFECTLY IMPERVIOUS, well ventilated and trapped drain, to at least twenty yards or more from the back door. We allude chiefly to villas and farm houses. Let village improvement associations, of which we hope to see many formed, extend their work to the back yards and lanes, as well as to the streets.

SANITARY CONVENTIONS IN MICHIGAN.

Two successful sanitary conventions have been held recently in Michigan: one on January 7 and 8, at Detroit, and the other on February 17 and 18, at Grand Rapids. We are indebted to the kindness of Dr. Baker, the Secretary of the Michigan State Board of Health, for reports of the proceedings of these conventions; and purpose giving extracts therefrom in our next issue.

The object of these conventions is to extend and popularize a

knowledge of practical hygiene. As the Grand Rapids *Daily Eagle* says, "these conventions are sanitary schools for the instruction of the people, institutes in sanitary science having similar purposes in that department to the purposes of farmers institutes in agriculture. Our people begin to understand the need of such instruction, and its usefulness, and hence there was a goodly attendance at the opening session of the convention, which was called to order by Dr. Hazlewood of this city, Secretary. He read letters from eminent sanitarians throughout the country, expressing sympathy with the objects of the convention."

Some very able and interesting papers were read and discussed at these conventions; reports of which, being largely published in the daily press of the country, must do a world of good, and hence these meetings can hardly fail to prevent sickness and preserve and prolong life, which is in short the chief object of all sanitary work.

Two papers of a general nature are especially valuable and noticeable: one by Dr. H. B. Baker, Sec. State Board of Health, on "General Sanitation," and one on the "Duties of the Christian in Respect of the Laws of Health," both of which, with others, we trust to be able to refer to again.

EDUCATION OF THE PUBLIC IN HYGIENE.

In their reply to questions sent out by the select committee of the Local Legislature, on public health, two years ago, a large number of medical men urged the importance of educating the public in matters pertaining to health, as a means of preventing sickness and death. There is no more practical, if any better way, to thus educate the people than by the distribution of periodical sanitary literature. With this object in view, the Ontario Government have provided means by which a copy of this JOURNAL is sent, and has been sent for the past few months, to the clerks of all the principal municipalities in Ontario. We trust such arrangements will shortly be made by which the Journal will be published in more popular form and its circulation very largely increased.

Annotations.

SANITARY INVENTIONS AND APPLIANCES.

We give below a brief description of a few of the many Sanitary Appliances recently exhibited in connection with the Sanitary Institute of Great Britain. From the *Sanitary Record.*

HYGIENIC VENTILATING STOVES.—This stove obviates the difficulties hitherto experienced in warming and ventilating apartments, halls, hospitals, public buildings, etc. By its use a room is warmed equally in every part, and a full supply of pure fresh air is being continually introduced in a warm state, while the inhaled air is being carried off, so that the air of the room is constantly changed, and a perfect circulation maintained. There is the cheerfulness of an open fire, and an absence of all dust; and these combined advantages are gained with, at the same time, a saving of at least 60 per cent., as compared with the cost of an ordinary fire.—Exhibited by the Hygienic Stove and Grate Company, Eagle Foundry, Broad Street, Birmingham.

WORKING MODEL OF 'MORRELL'S PATENT SELF-ACTING CINDER SIFTING ASH-CLOSET.—For use at gentlemen's houses, workmen's cottages, schools and public institutions. Ordinary house ashes are used. The cinders are separated from the dust, a sufficient quantity of which is distributed over the excrement each time the closet is used, thus preventing all smell, and producing a valuable manure. By a new arrangement the dust is kept from rising. Is entirely self-acting; over 6,000 in use.—Exhited by the Sanitary Appliance Company, Limited, Factory Lane, Salford.

EARTH-CLOSETS.—Apparatus throwing earth, on pulling a plug, similar in appearance to that of a water-closet. Portion of apparatus showing efficiency, strength, and simplicity of throwing parts. One cheaper and one better commode on above principle. Tanks exhibiting larger receptacles than the pails ordinarily used. Apparatus hiding contents of the receptacle, on the principle of the water-closet 'cup.' Model of closet showing arrangement for leaving interior free at all times from intrusion, by attendant filling hopper or emptying receptacle. Msdel of upstairs closet, showing how it may be attended to from ground floor, without attendant ever entering

the house. Exhibited by Moules' Patent Earth-Closet Company Limited, 5A, Garrick Street, London, W. C.

THE "CROWN" PATENT SAFETY BOILER.—For instantly turning cold water into hot, and producing boiling water within one minute from lighting. Design simple, danger from accident *nil.* Copper and hard solder used in its construction. Heating by atmospheric gas. The water may be used for cooking, cleaning, or for baths. A hot cupboard for warming food or drying linen, is furnished with each boiler. Any plumber or gasfitter can fix the apparatus.—Exhibited by Ewart and Son, 346 Euston Road.

PATENT PORTABLE DISINFECTING APPARATUS is a large apparatus for disinfecting bedding, clothes, etc., by heat. Is carried on wheels, and intended for country districts and camp use. The clothes are placed inside, and the folding doors shut, and the heat maintained by a small furnace placed underneath to a temperature of from 250 to 300 degs. Sulphur and other chemicals may be used, but disinfection is perfect without. This is an application, in a portable form, of the apparatus erected by Messrs. Fraser, as appears by their list, in most of the principal hospitals and infirmaries in London and the Provinces. A great element of safety in the use of this apparatus is, that the fumes given off by disinfecting are passed through the fire and rendered harmless.—Exhibited by Fraser Brothers, 98 Commercial Road East, London.

BUCK'S PATENT RAIN-WATER PERCOLATOR for collecting rain-water. The function of the Percolator is to reject the bad and store the good water. It is self-acting, and prevents the first portion of the rainfall (which washes off and brings down from gutter or roof all kinds of impurities) passing into the storing tank, by directing the water into a waste pipe or separate tank for a time; afterwards when a certain quantity has passed through, the Percolator cants and turns the pure water into the storing tank.—Exhibited by Ryan Bros., Ludgate Circus.

BRIGHTON 'EXCELSIOR' VALVELESS WATER-CLOSET AND URINAL. This closet is shown in action, fitted complete with the Patent Automatic Flushing Cistern in two forms. The first is with the cistern fitted and connected to the closet in the ordinary way, *i.e.*, with the cistern about 5 ft. from the seat. The second is quite a novelty, the closet and cistern being fitted as a piece of furniture. No pipes

or wires of any description are seen. Another advantage is that this closet can be made to flush itself say once a day, or at longer intervals, and yet be a perfect water-waste preventer. The urinals have advantages which speak for themselves.—Exhibited by Dan. Thos. Bostel, 18 and 19, Duke Street, Brighton ; 8 Golden Lane, London

PATENT 'EARTH TO EARTH' COFFIN.—A light, perishable coffin, designed to aid innocuous resolution by permitting the soil to come speedily in contact with the corpse, instead of the destructive putrefaction caused by the ordinary solid coffin. The rapid and natural destruction of a corpse is the result obtained by this mode of interment.—Exhibited by the London Necropolis Co., 2 Lancaster Place, Strand, W. C.

MARSH MIASM AND FEVERS.

Abundant experience (*Scientific American*) has aleady established the following facts regarding the appearance of intermittent fevers and the causes which are designated as *malaria:* First, that the real cause is to be sought for in the soil, where it is developed in greater intensity under favorable conditions of heat and warmth; second, that this poisonous substance, when the substance is dry, is lifted up a little above the surface by ascending currents, and can then be carried further or raised to a greater height by stronger draughts of air ; third, that this substance, the cause of the malaria, is not developed in every soil of the same composition and the same degree of moisture, a circumstance which has repeatedly led to the assumption that it possesses the nature of a specific organism, which requires for its development not only the most favorable conditions, but first of all a *germ* from which it is developed.

From time immemorial the Roman campagna has been known as one of the poisoned plague spots of the earth, hence the interest that naturally attaches to the investigations made there last spring by Klebs and Tommasi-Crudeli.

The malarial powers of different kinds of soil, of water and of air were tested. The solid and liquid portions of the former were tested separately. Under the supposition that the germs of the disease were organisms, substances rich to infective matter were exposed to these conditions which have been found by experience most favorable to the development of the disease (30° to 40° C., or 86° to 104° F. ; plenty of moisture deeper in the soil and rapid evapora-

tion on the surface.) Small substances thus prepared were transferred to different liquids for cultivation, and then experiments were made to determine whether after frequent successive fractional cultivation, the same activity was presented as in the substance first employed. Finally, the liquid was mechanically separated from the solid microscopic particles in the cultivated liquids, as in the original, by filtration through gypsum and other filters, and the relative activity of filtrate and residue separately examined. To test the activity of these different substances they were injected hypodermically into rabbits; the temperature was examined every two hours, and the dead body examined. The regular intermission of the fever and the swelling of the spleen and want of other changes were employed as guides and measurements.

The results may be briefly summarized as follows:

1. The malarial poison is found in larger quantities and disseminated through the soil of malarial districts at a season when people are not yet attacked by disease.

2. At these times it may also be obtained, in especially favorable places, from the strata of air nearest the surface. To test this, 300 liters of air were thrown with great force and velocity against a glass plate covered with glue solution, to which the solid particles in the air adhered.

3. Stagnant water in malarial districts seemed not to contain the disease, although it may be, like the lake of Caprolace, extraordinary rich in lower organisms. Their experiments indicate that a large quantity of water hinders the development of malarial poison and renders the germs which are present inactive.

4. By infection with the above fluids, some directly from the soil and others prepared by cultivation and filtration, a fever was produced in the animal of the regular type, with intermissions, which lasted up to 60 hours, and an increase of temperature up to 40° C. (104° Fah.)

5. The filtered liquids caused but very slight increase of temperature even when five times the quantity was injected. Even filtering through a double paper filter seems to remove the malarial poison.

6. Animals infected with malarial liquids all showed a swelling of the spleen, and in many of them was found a black pigment.

7. The organisms which were the real cause of the malaria belong to the genus *Bacillus*. They are present in the soil of malarial re-

gions in the form of numerous movable brilliant spores of long oval shape, with a greater diameter of 0·95 micrometer. They grow, both in animals and in cultivating apparatus, but afterward divide and develop again within the limbs. These spores first form on the walls, but finally the whole interior of the member becomes filled with these little bodies. Owing to their peculiar morphological action they must be looked on as a new kind of bacilli, and have been named *Bacillus malariæ*.

8. These organisms will not develop if atmospheric oxygen is excluded, and hence belong to the class of Acrobii. They do not develop in water, but will in nitrogenous liquids, like solutions of glue, albumen and the fluids of the body. Sometimes the fibers reach the length of 0·06 to 0·084 mm.

REPORT OF KENTUCKY STATE BOARD OF HEALTH.

First Annual Report (*Sanitarian*), 1878, an 8vo pamphlet of two hundred pages, and three plates; two showing sections of Bowling Green and Hickman, where yellow fever prevailed, and one illustrating the construction of a sewer of Béton, Paris. After a copy of the Act establishing the Board, (which is a copy of the State Health Law of Michigan), follows the Report of the Secretary, giving the minutes of orginanization, April 3rd, 1878.

Pinckney Thompson, M.D., was elected President, and N. J. Sawyer, M.D., was chosen permanent Secretary.

The first act of the Board (after organization), was to address a circular to the County Judges of each county throughout the State, requesting them to appoint their several local boards, in conformity with Article Eight of the Act establishing a State Board—that "It shall be the duty of each county court to appoint for their respective counties, a Local Board of Health, which board shall consist of three members, one of whom must be a practicing physician in good standing."

The second meeting of the Board was held September 5th, with special reference to measures of relief for the people of Hickman, suffering from yellow fever. Dr. Luke P. Blackburn,a hving volunteered his services under the auspices of the State Board, was requested to proceed to Hickman, and remain there as practicing

physician as long as the people there required his services, and to make report to the Board. At the request of the President of the Board, the Governor directed Mr. John R. Proctor, Assistant State Geologist, also to proceed to Hickman and make a geological survey of the town, and to compile as many facts as possible concerning the prevalence of yellow fever there. Mr. Proctor's official report to the Governor, constitutes an important part of the State Board's Report.

Dr. Pinckney Thompson, President of the Board, also makes a special report on 'Yellow Fever in Kentucky.' He visited Hickman, confirms the report of Mr. Proctor in regard to the local conditions of that place, and the history of the first cases. He succinctly reviews the observations of various persons on yellow fever in Kentucky and elsewhere, and concludes:

"That yellow fever is strictly an infectious disease, and that it is communicable only through the atmosphere, and not from any contact or association with the sick, or from fomities, except as these agents come in contact with an atmosphere containing the three requisite co-existing conditions."

The three requisite conditions referred to are: high temperature, humidity and a foul atmosphere—consequent upon the emanations arising from the decomposition of organic matter.

"One of the essentials to the existence of yellow fever is certainly under human control. A contaminated atmosphere *can* be prevented *largely*, if not altogether. We *can* have comparatively pure air. It is a very common practice, when any unusual sickness occurs in a town, to begin to clean the streets, especially if the sickness occurs in the spring or summer. I could never see the wisdom of waiting until spring or summer to begin this important work. It is true that the active poison in this filth is held in slight abeyance in the cold weather, but in the meantime it is hiding itself in the earth in order to make its appearance in the first few days of warm sunshine. Therefore clean up the towns and keep them clean, and so have pure air to breathe, and you are free from one of the chief factors of yellow fever.

THE *Medical Record* says of the doctors in Memphis in 1878: All the homœopaths ran away when the plague existed. Of the forty-six regulars, ten ran away; of the thirty-six remaining, twenty-eight were attacked by the fever and fourteen died; eight had already had the disease, and were not attacked at all.

VITAL STASISTICS IN QUEENSLAND.

The annual report of the Registrar-General for the Colony of Queensland for the year 1878 is instructive. It shows that during that year 2888 persons were married, 7397 children were born, and 4220 persons died: Hence during the year, 14,505 additional names were added to the registers; the number in 1877 having been only 13,496. It is calculated that there was 1 birth to every 28 persons living, or about 36 per 1000 of estimated population, and 1 death to every 40 persons living, or 20·5 to every 1000 of population living during the year. The birth-rate in Queensland is higher than in either of the other Australian colonies, and the proportion of illegitimate births is 3·68 per cent. of the whole number in the year. The mortality of the year 1878 was heavy, considerably more so than in any year during the last decennium, excepting only that of 1875.

The mortality amongst children has been large, but this is chiefly accounted for by the large proportion of children living in the community, as compared with many other places; the average infant mortality in Queensland shows favourably in comparison with that of England and Wales, and also with that of South Australia, but not with the average infant mortality of the Australian colonies generally. If the rate of infant mortality is taken as an indication of the sanitary condition of a locality, it must be conceded that Brisbane is not a very healthy place; for while the death-rate of children under twelve months, in the year under review, was 27.59 in the country districts, it was 36·04 in Brisbane. In this respect Queensland is like most other countries. The general mortality in the latter town compares favourably with that of several of the other towns in the colony. As to the causes of death, dysentery proved the most fatal during 1878; whilst phthisis, as in Ontario and elsewhere, maintains its premier place among the constitutional diseases. The idea that obtained for many years, that the warm, dry climate of Queensland was favourable to persons suffering from pulmonary consumption, would at first sight appear not to be borne out by the statistics of disease in the colony; but it has to be remarked that the death-rate from phthisis in Queensland is considerably increased by the prevalence of the disease among Polynesians.

The report shows that the population of the colony on December 31, 1878, consisted of 220,510 persons—127,608 males and 82,902 females. The increase of the population by immigration during the year was 6556 Europeans, against which number must be set 2136,

the excess of departures over arrivals of Polynesians in the same period. The nationality of the population is given as follows :— Europeans 90½ per cent., Chinese 7 per cent., and Polynesians 2½ per cent.

VITAL STATISTICS IN NEW SOUTH WALES.

The annual report of the Registrar-General of New South Wales for the year 1878 gives some valuable and interesting information. It shows that the estimated population of the colony on December 31 of that year was 793,743 persons. The increase on the previous year amounts to 31,531, or 4·76 per cent. The estimated number of males was 385,67°, and of females 308,065 ; giving 556 males and 444 females to 1000 of population.

The number of births registered in the colony during the year was 25,328, being 1477 in excess of the previous year's return, and giving a ratio of 37.50 to every 1000 of estimated population ; this is slightly in excess of the figures of the previous year, but 1·26 per cent. lower than the average of the previous nine years.

The number of deaths registered during the year was 10,763, which is an increase of 894 on the previous year ; the death-rate for the colony for the year was 15·93 per 1000 of estimated population, as against 15.34 for the previous year. The average death-rate of the previous nine years was 14·95, which is lower by 0·97 than the figures for the year under review. The number of children who died under five years of age was 4884, which makes the percentage of these deaths to be 45.37 of the total mortality for the year. With the exception of the year 1875, 1878 shows the highest percentage of any year in the decade. It was 1.86 per cent. over the figures of the previous year, and also 2·52 per cent. in excess of the average of the previous nine years.

Zymotic diseases during the year 1878 were responsible for 25·61 per cent. of the total number of deaths, and of this class the order known as miasmatic furnished 22·66 per cent. ; these figures were 2·34 in excess of those for the previous year, and 3·04 per cent. in excess of the average of the last nine years. The four warmest months of the year were December, January, February, and March, the mean temperature ranging from 71·8° to 69·4°. The months of December and January head the list with the highest rate of mortality. February, March, April, and May supplied the greatest rainfall, the number of inches being 6·87, 5·98, 5·75, and 8·10 respectfully.

VITAL STATISTICS OF NEW YORK.

According to a table just issued (*Sanitarian*) by Jno. T. Nagle, M.D., Deputy Registrar of Records of the Health Department of New York, the total numbers of births, marriages and deaths (with an enumeration of some of the most prominent causes of death), during the year, 1878, were as follows :

Total births reported (including 2,192 still births), 27,921 ; marriages, 7,629 ; deaths, 27,008 ; small pox, 2 ; measles, 272 ; scarlatina, 1,099 ; diphtheria, 1,007 ; croup, 499 ; whooping cough, 382 ; typhus fever, 4 ; typhoid fever, 245 ; cerebro spinal fever, 97 ; diarrhœal diseases, 2 945 (of these 2,598 were under five years of age) ; consumption, 4,456 ; pneumonia, 2,288 ; bronchitis, 1,184. Of the total number of deaths, 12,410 were of children under five years of age.

Deaths per 1,000 (estimating population at 1,083, 371), 25.93, being an increase of .43 per 1,00 over the previous year ; but, excepting 1877, the smallest recorded ratio of deaths to the population of any year since 1846 (24.02), at and previous to which time, however, the registration was much less reliable than it is at present. It is very doubtful, however, whether the present death rate of New York and several, if not, indeed, most of our cities is not underestimated by an exaggerated estimate of population ; the custom being to measure the rate of increase in population by the gain between the United States Census of 1870 and the State Census of 1875, or between 1960 and 1870. There is good ground for the belief that our city populations generally have not increased during the last five years in the same ratio as they did in the last preceding —soon after the war. And not only so, but some have actually decreased as pointed out by Dr. Snow, of Providence, R.I., more than a year ago.

VITAL STATISTICS OF RICHMOND, VA., U.S.

Richmond Board of Health Report for 1878, (*Sanitarian*), shows that ' with a steadily increasing population, the rate of mortality has been steadily decreasing,' which speaks well for the sanitary administration. The diminution in the number of deaths for the year, as compared with the year previous, was 176, the total number being 1,454. Ratio per 1,000 of population (80,000), 18.40—of the whites (46,000); 14.32 ; colored (34,000), 23.88.

Of the total number of deaths, 338 were from zymotic diseases, 105 of them being from scarlet fever. 234 died of consumption.

An increase of the force for cleaning the streets, extension of the sewers and the prevention of public funerals at the burial of persons dead of scarlet fever and diphtheria are urged as important measures for the protection of the public health.

HOT AIR FURNACES.—J. P. Battershall, Ph. D., presents in the *Sanitarian*, the following, which is supported alike by scientific and practical experience: (1) Furnaces formed of several castings bolted together are very liable to leak gas, owing to the unequal contraction and expansion of the metal by changes of temperature. (2) Cast iron furnaces made of three pieces (fire chamber, body and radiator), each cast solid from the best quality of iron, if properly managed, do not permit the escape of gas. The pieces are firmly united in deep grooved joints, and these connections which are lateral are packed with fire clay. (3) Carbonic acid cannot permeate cast iron one-half inch or more in thickness to an appreciable extent. (4) Air heated by cast or wrought iron furnaces is as pure when hot as when originally introduced into the furnace, provided, that the latter is properly constructed and the supply of cold air properly regulated. Doing a large amount of heating with small furnaces is the great cause of the over-heating of the surface and consequent generation of vitiated air. (5) In brick lined fire-chambers, the danger of overheating is lessened, but owing to the reduced radiating surface the power of the furnace is greatly decreased. (6) Cast and wrought iron exhibit when heated to redness the same behaviour to gases and are both liable to become over-heated. In all cases large furnaces should be used to overcome this objection. (7) The construction of small, cheap, light-jointed furnaces put up by inexperienced men is but poor economy and is the chief cause of the evil effects so often observed in our general heating apparatus. (8) A large proportion of the gas that frequently contaminates the air in our dwellings escapes from the furnace during the introduction of fuel. The smoke pipe damper should be opened and the lower furnace door closed when coal is added.

VALUE OF FRESH AIR IN FEVERS.—At the late sanitary convention at Detroit (*Good Health*), in the discussion of a paper on ventilation, an old army surgeon related a very interesting ex-

perience illustrating the importance of securing to the sick, and expecially persons suffering with fever, an abundance of pure air. He stated that during the war he had charge of a large hospital in which at one time in the winter season he had under treatment three hundred and twenty cases of measles. Just at this time the hospital took fire and burned to the ground. The patients were placed in tents, and all but one or two recovered. He had no doubt that the number of deaths would have been thirty or forty at least had the patients remained in the hospital. He afterward sent one hundred men who were only slightly ill to the general hospital at Nashville, and seventy-five of them died. Upon visiting the hospital, he found it so poorly ventilated that the air was exceedingly foul, producing a sickening sensation when he had only been in it for a few minutes. The Doctor concluded by remarking that he regarded pure air and water as most important agents, and believed them to be capable of controlling the ravages of raging disease.

INCREASE OF LUNACY IN GREAT BRITAIN.—From the report of the commissioners in lunacy for the past year it appears that the number of lunatics is increasing at a very alarming extent. On the first of January last the number of persons registered as of unsound mind in England and Wales numbered 69,885, of whom 7,778 were classed as 'private citizens,' and 72,108 at pauper lunatics.' Twenty years ago they numbered only 35,762, and ten years ago, 53,277. An examination, too, of the proportion of lunatics to population shows that in 1869 the ratio of lunatics to 10,000 of the population was 18.67. It is now 27.77, or an increase of 50 per cent. The increase, however, is much greater in the case of pauper lunatics than in that of private patients, the increase of the ratio in the former being 53 per cent. and in the latter only 23.6 per cent. The only satisfactory point to be gathered from the statistics is that although the ratio of pauper lunatics is steadily advancing year by year, there has been no increase in the proportion of private patients to the population during the past four years. She insanity of no fewer than 21.3 per cent. of the number of men admitted to asylums during 1878 was assigned to intemperance; while among women the proportion was only 7.8 per cent.

ENTERIC FEVER AND POLLUTED WATER.—An outbreak of enteric fever of a somewhat alarming kind has broken out in the female

Orphans' Home in Jersey, an institution that contains about 140 girls of various ages. We learn from an authentic source that the family from the orphanage have, as a rule, enjoyed excellent health, and did so up to May 18, when several were suffering from what was declared to be gastric fever. On searching for the cause, it was attributed to the water from a well which has been in existence and supplied the wants of the locality for at least a century. But on additions and changes being made on the property in 1862, a cesspool some six or seven feet deep in dry rubble stone was made some fifty or sixty feet from the well, in red clay; this received the sewage from water-closets, and to this cesspool is attributed the pollution of the water, which in colour and taste showed no sign of impurity, but on being tested, was proved to be impure. The particulars of this analysis, by Mr. Morgan, will be found in the *Chemical News* of August 29. The closing of the well put an end to the cases of typhoid, which seems to confirm the truth of the conclusion arrived at.

DR. WM. FARR AND THE REGISTRAR GENERALSHIP.—There can be but one opinion, says the *Medical Times and Gazette*, as to the treatment to which Dr. Farr has been subjected, and we think that his dignified and temperate letter to Major Graham, the retiring Registrar-General, deserves to be known by all: "December 23.—Sir,—Having now heard from you that Sir Brydges Henniker is to be the new Registrar-General, and thus having lost all chance of being your successor, I shall be glad if the Lords of her Majesty's Treasury will allow me to resign my appointment, and will grant me superannuation allowance to the extent of my full pay. I have served under you nearly forty years, I have taken with you three censuses, and I feel confident that I can leave my case in your hands.—(Signed) William Farr." The Government doubtless has its reasons for passing over Dr. Farr cut and dry, but by ordinary people no valid reason can be found for passing over the claims of one who has earned a world-wide reputation in the discharge of his duties, in favour of a mere political partisan, possessing, so far as is known, not a single qualification fitting him for the important post of Registrar-General.

THE BOARD OF HEALTH OF THE CANTON OF DURICH—(*Med. Times and Gazette*)—have just taken an important step with regard

to the prevention of infectious diseases. They have issued an order that every case of such disease, however slight, is to be reported direct to them, and for this purpose they have furnished every medical man in the district with books provided with counterfoils. Sanitary commissions, instituted with this object, will be obliged to send instructions to the medical men when the cases are considered serious, and will prescribe the means of disinfection, the isolation of the sick, and other precautionary measures. The results of the information sent by the practitioners will be published every month under the direction of the Board of Health.

ERYSIPELAS AND SEWER-GAS.—The *Chicago Daily News* states, that in a house fitted 'with all modern improvements,' in that city a physician was recently called in to attend a lad suffering with facial erysipelas. He found the boy's elder brother just recovering from a large carbuncle, and the mother, convalescing from erysipelas, had a patch of gangrene as large as a quarter dollar. Although no unpleasant odour was perceptible, and the plumbing seemed all right externally, careful examination revealed the soil pipe to be disconnected from the sewer connection beneath the basement floor, and the ground was literally soaked for yards in extent with the contents of the soil-pipe.

IMPORTANT ADVICE.—Beware of salves, beware of plasters, beware of eye-waters, beware of hair-dyes, beware of washes for refining the skin, beware of toilet powders, and be careful in the use of scented soaps. Why? Salves make and keep the skin sore, plasters prevent wounds from healing, eye-waters do often more injury than good, most hair-dyes produce sore eyes, beautifying washes are often poisonous, ditto toilet powders, while scented soaps are usually too sharp by the free alkali they contain. We will from time to time give proofs of the correctness of the above severe criticisms.—*Practical Americna.*

FIGARO states that when Dr. B. asked what was his fee, he was said he had no fixed price, adding that a physician's hand should be like the collecting-bag at church, into which the rich put what they pleased, and the poor what they can.