

in it has, of late years, received a great check, experience proving the fact that the sewers of a populous city are mere arteries of corruption, infecting with disease the busy world residing above them. Says an authority (R. Car. Harris, associate member of the Institute of C.E.): "*The occupant of a city mansion would do well to plug up the outlets of his marble baths and wash basins, and seal up his water-closets if his object is health. Better the primitive inconveniences of our ancestors than the gilded death traps of modern cities.*"

Dr. Littlejohn, medical officer of health for the city of Edinburgh, made a statement that, "*in the new town (Edinburgh), which is inhabited by the better classes, and is pre-eminently a water-closet town, typhoid-fever and diphtheria are never entirely absent and are frequently endemic, and it is noticed that these diseases have been 'the greatest in the best houses.' But in the old town, which is badly ventilated and which is crowded with very poor people living in close rooms, and where they still make use of pails for the reception of excreta which are emptied daily into carts provided by the authorities, typhoid fever and diphtheria may be practically said to be unknown.*"

We might quote numerous, and equally reliable authorities, to prove that the water-carriage system has been an entire failure, and instead of bearing off *in toto* the impure matter, forms a bed in which the germs of disease are bred, nursed, and scattered through numerous arteries into every dwelling.

In further corroboration of these statements, history itself bears out their truth. Among aboriginal tribes, unless infected by communication with the whites, zymotic diseases are entirely unknown. The earth is to them the deodorator and disinfectant of all excreta. But in our rural districts we cannot say so much; the wells are becoming poisoned from the percolation of foul matter into them from cess pits, and cases of typhoid fever and diphtheria, of a very malignant kind, now frequently occur.

It may naturally be asked, is not the great supply of water that we possess sufficient to carry off every impurity that is conveyed into the drains? What can possibly rest in the smooth lead pipes, and the smooth glazed tile pipes which lie within the house, fresh water constantly passing through them? Surely the immense body of water which flows constantly through the sewers must bear with it to the river, in a very short time, all that passes into them. Reader, have you ever entered into any of the main sewers of a city and examined them? have you ever seen a sink pipe cut in two when being repaired after it has been in use for even only one year? Probably not, but we have in the performance of our professional duties—and what we state is no theoretical idea to the truth of which we cannot attest—but we can positively assert from personal observation that the common sewer and house pipes are lined with a most foul and slimy mucus, that adheres to them like birdlime, which no flushing of water will totally carry away; that the bottom of these sewers, when the fall is slight, is always more or less covered with the more solid parts of sewage, which lies there and putrefies until the sewers are flushed with a heavy rain, which then only carries off a portion of their contents; that, at the connection of the side drain with all the branches of the main sewers, where the flow of sewage of the side drain is interrupted by coming in

contact with the current of the main sewer, a deposit of sewage matter, as a consequence, is not only formed there, obstructing the passage, but adding, if possible, more putridity for the emanation of noxious gases.

We have no conceivable idea of the quantity of foul gases bred in the whole area of city drains; we can, however, form some idea of it when, on certain atmospheric changes, we find an almost choking effluvia arising through the gratings of the catch-basins in the streets, or when, on a frosty morning, we can see the damp hot vapours rolling out of them and condense in the cold pure air.

So long as the street gratings keep open there is some safety valve, during the night particularly, to the city resident, but when in winter these gratings are frozen up and closed, where is this immense body of bottled up gas which is always accumulating to go to? It must have some escape, and that escape undoubtedly is through the house drains. The water in the trap absorbs it, and every time the water in the water-closets and sinks pass through the traps, there is a flow of gas into the house. The most important sanitary question of the day is to devise a proper system of street and house drainage which will carry off the whole of the sewage before it has time to putrify. Cities that have already adopted the system have sunk too much capital therein to abandon it and venture on another way of disposing of excreta, which might not, after all the additional cost, turn out satisfactory. This being the case, corporations are bound to do everything in their power to check the evils of the system, and that only can be done by exacting the most stringent regulations in the execution of work for house drains and plumber's work, which should be looked upon as a sanitary duty that does not concern the individual who builds a house, but the citizens at large; therefore the planing and the execution of the work should be taken out of the hands of private individuals, wherever these plans are likely to be detrimental to public health. A strict surveillance over the construction of the house drains and plumber's work and the connection of the tile drains with the water-closet pipes, to prevent the possibility of leakage, is absolutely necessary, and also the introduction of traps so perfect in their construction that gases, under no amount of pressure, can pass through them—simple water traps being only a partial preventive. There should also be a proper system of ventilation to all street drains and water-closets to carry off the gases as fast as they accumulate, and further, the most stringent regulations should be enforced to prevent the wooden paved yards of the poorer classes from being saturated with impurities thrown into them, from which the boards and the earth beneath them become saturated and sodden with putrid vegetable and animal matter.

The foregoing remarks naturally lead us to the main point for consideration as to what immediately concerns us, and that is the sanitary condition of Montreal.

It is now an undisputed fact that Montreal is the most unhealthy city in North America; why it is so is entirely owing to its imperfect street and house drains; in every other respect it has great sanitary advantages, being surrounded with a pure atmosphere, free from any marshes, which breed malaria and ague. A large and rapid river flows past the whole line of its front, with a current varying from 6 to 8 miles an hour, which is sufficient to carry off the sewage miles away in the