

perfect as possible to save themselves from loss by having contracted at too low a figure.

We have so far, in these observations, endeavored to impress upon the reader the fact that, although wherever the water-carriage system of sewage can be carried out, it will always, from its convenience to the public, have preference to any other, it is the most dangerous of all the systems, and the safety of the public in a sanitary point depends entirely on the following conditions:

1st. Street sewers well designed and built so that they will carry off rapidly the sewage.

2nd. House drains and their connections with the sewers so perfectly made that it will be impossible for gases to escape through the joints.

3rd. Perfect plumbers' work.

4th. Perfect ventilation to the street sewers and at all the highest points in a dwelling—and, lastly, a thorough superintendence, by a competent and trusty person, over the most minute details of the construction of all sanitary works.

To a great many of the sanitary evils from which we suffer, there are several simple cheap and effectual remedies, but it would occupy too much space here to point them out.

Before, however, concluding these remarks, there is one thing we would wish to impress upon the public mind, which is, that very poisonous gases may exist in drains without giving out any perceptible odour, and, also, that people get so accustomed to odour of foul gas as not to recognize it, and are thus lulled into security until death knocks at the door.

The principal dangers to be apprehended are from leakages in soil pipes, from imperfect joinings or from corrosion, and from gases passing through traps which have no other interposition to their entrance to a dwelling than the water contained in them. No greater error exists than the supposition that because a pipe is trapped it is a preventive to gases passing through it. Even the trap itself, if not kept constantly cleaned out, becomes the receptacle of a filthy sediment which, as before stated, the mere flow of water running into it from a sink cannot remove. There is not a sink pipe in this city that, after one year's use, is not thickly coated, a quarter of an inch thick, with a vile smelling, poisonous, and glutinous substance formed from soapsuds, grease, and other substances. Nor is it to be supposed that whenever such evils exist, fevers always follow; but where they do not, the pale face and debilitated state of health of the weaker inmates of a family tell the story.

Of late years a great sanitary reform has taken place in England and North American cities; but at no period has it ever received more attention than at present. Sanitary societies have been formed in every section of the country, and meetings held by eminent engineers to discuss the most important questions submitted to them by public authorities. It is after all not so much a matter for wonder that London, with a population of nearly four millions, is one of the healthiest cities in the world, when public interest is so marked in favor of sanitary improvements and regulations—but it is, indeed, a matter of surprise and a crying shame that Montreal, with a population of only about 150,000 inhabitants, and with far superior sanitary advantages to London, should be the most unhealthy city in North America.

There is one point which we desire particularly to

impress upon our readers and that is, wherever the system of drainage is perfect (when we speak of a perfect system we mean every part of it within or without a house), the inhabitants of a town will be comparatively free from zymotic diseases, if no other cause prevails.

It has often been a matter of surprise to wealthy residents in Montreal that, after spending so much money to secure good drainage, some of the most virulent cases of typhoid fever or diphtheria have occurred in their houses. The reason for this, however, can be easily explained. Sewer gases being much lighter than the atmosphere, will always ascend and seek to escape at the highest point in the sewer or house drain. When diseases, such as described, exist in the lower parts of a town, the gas produced from the decomposition of excreta discharged in the sewer will ascend to the highest point, and thus the sewer becomes a powerful duct for the conveyance of disease from the lower parts of a town to the highest localities, and, consequently, the inmates of the finest houses in the otherwise most healthy and elevated positions in a town, are actually in greater danger than those living in the low lying districts. We have a frequent example of this fact in tenement houses, where, for the sake of economy, one water-trap only is often placed in the cellar, which is made to answer for the whole house, and what is the consequence? why the drain pipes in the upper tenement become most perfect ventilators to the lower tenement, the latter being always free from the smell of gases, the upper hardly ever so. In this case, a single water-trap in the basement is simply a reservoir of filth, which the mere flow of water through it has no power to remove.

Sewer gases are looked upon, unfortunately, with too much indifference; in fact people become so accustomed to the odour, where it exists, as to be unable to detect it; its presence, however, is quickly felt by those unaccustomed to it. It is only when too late, when two, three, and four sometimes of a family are borne off to the grave, that we awaken to the fact that this indifference had destroyed the lives of our children.

When a tenant perceives the odour of sewer gases in his house, he should endeavor to get his landlord to visit the residence, when these offensive odours are prevalent, for it frequently happens that gas is forced through the traps or defective pipes under certain atmospheric circumstances only, and what was intolerable one day, may not be felt the next. This has been the cause of litigation in this city already, and in a case where a tenant abandoned his house, on account of bad drains, he lost his case because his landlord was able to prove, by witnesses, that they had examined the premises and found no bad smell therein; had they called in to examine them at a favorable time, they would have had a different tale to tell. In all such cases the proper way is to call in a professional person who will find out the cause and *prove it*.

Another important matter in connection with health is the ventilation of rooms in public buildings and dwelling houses. The atmosphere of a house becomes impure from other causes besides sewer gases, sufficiently so to cause, in time, great debility to those who have to live much of their time indoors. The air we have inhaled is not fit to be used again, and should be constantly replenished from a pure source.

In concluding these observations, we would remark that the principal reason why mistakes occur in the con-