

Sewers.

Formerly it was the practice generally in towns, as it is now in many places, to throw the slops and liquid refuse produced in the houses out on the surface of the ground or into the streets; to retain the faecal matter in cess pits sunk deep in the subsoil under the privies within or near the houses, and to remove the putrid accumulations occasionally by bucketing them out and carting them away. By this process, which lasted for centuries, the slops and waste water contaminated the surface; the liquid filth oozed from the cess pits, saturated the subsoil and polluted the wells and springs from whence water was drawn for drinking and cooking, and the obnoxious vapors which exhaled from the decomposing filth in the cess pits poisoned the air breathed by the people. Doubtless this state of things produced or aggravated those terrible diseases and pestilences which periodically ravaged and destroyed thousands of the people who were thus unconsciously the cause of their own affliction and death.

But in the course of time sewers were laid down from the watercourses or rivers along the streets for carrying off the surface water, as well as the liquid refuse produced in the houses, which as hereinbefore was poured down the gutters and gullies, the houses being still unprovided with drains; and as the districts were extended, sewers were continued into them from the old sewers or from the nearest watercourses and ultimately the streams or rivulets into which the sewers discharged themselves were converted into covered sewers and arched over. It should be noted that during this time each house had its cess pit for storing the faecal matter which was not permitted to enter the sewers, and as the oldest parts of the town were usually seated high on the sides of ridges or hills rising directly from the streams or rivers or from the flat ground near them, and the rain falling upon the houses and streets and the waste water thrown into the streets descended quickly and passed away without requiring sewers to remove the rain and refuse water. But, as the base of the slopes and the flat grounds near them were built upon sewers were carried into the streams or rivers through these grounds and up the slopes to prevent the descending waters from flooding the lower surfaces. Generally these sewers were laid without much attention being paid to their direction, shape, fall, or capacity, and in consequence most of them were inadequate for future extension and the use they were subsequently put to.

This system of drainage prevailed for a very long time until the springs and wells became insufficient in quantity for the increased population, and so bad in quality from being tainted with the percolations from the cess pit as to be unfit for domestic uses, particularly for drinking and cooking. When water was brought from purer

sources from a distance and delivered by pipes into barrels or cisterns placed in or about the house to receive it, sinks were fixed in the kitchens, sculleries and wash houses with drains leading from them into the sewers in the streets, and into these drains the rainwater from the roofs, yards and areas were conducted. Thus were provided street sewers with gullies for removing the rainfall from the surface, and house drains with sinks for removing the waste water from the houses. While this system was in vogue the drains and sewers as well as the streams into which they discharged themselves were comparatively innocuous because the cess pits containing the faecal matter were not allowed to be connected with them. It was thought that if this matter was admitted into the drains and sewers it would deposit therein and become a worse nuisance than in the cess pits owing to the small quantity of waste water discharged with it being incapable of carrying it away. But as water was now supplied by pipes to cisterns in the houses, water-closet contrivances were put over the cess pits with pipes laid from the cisterns into the pans to keep them clear. And then, as the subsoil became clogged or unable to absorb the increased quantity of water discharged from the pans, the cess pits overflowed and were obliged to be connected with the drains communicating with the sewers. Thus was completed the system of combined drainage which is now generally in operation and which is the result as we have seen of chance and necessity and not of deliberate consideration as to the best method of removing and disposing of the rainfall and sewage.

About thirty years ago inquiry was made into the working of this system. It was found that generally the drains and sewers were flat bottomed and excessively large, that the liquids discharged into them were, in consequence, powerless to remove the faecal matter which continually accumulated and was periodically removed by lifting it to the surface and carting it away the occupation of the nightman being thus transferred from the cess pit to the sewers, and that from the exposed area of the deposit in the sewers, which averaged four times that in the cess pit, noxious gases constantly emanated and flowed up the drains into the houses and streets producing fevers and epidemics to a large extent. Then as a remedy for this evil, various improvements were introduced, such as flushing the sewer instead of cleansing them by hand labor and cartage, putting down egg-shaped sewers with curved junctions in place of flat bottomed sewers with square junctions; laying house drains and small sewers of impermeable stoneware in lieu of porous brick and stone and substituting water closets for cess pits which were abolished.

That this method of draining and sewerage towns where it has been properly carried out and carefully attended to is better than any that has preceded it, is

fully proved by the immunity of the populations from those dreadful diseases which formerly attacked them and by the death rates as a rule being much lower than they were. So far this is satisfactory, but the question may be asked, does this system perform all the duties imposed on it thoroughly and efficiently? In other words, is the rainfall removed from the surface by the drains and sewers into the streams and rivers as free from contamination as it might be; is the water which percolates into the subsoil carried off by the drains and sewers so as to keep the house free from damp? And is the sewage removed from the houses and other buildings by the drains and sewers without in any way soaking into and contaminating the subsoil, poisoning the air of the houses and streets and polluting the streams and rivers? These questions involve a consideration in detail of the subjects mentioned which we will latter on discuss.

For Reform in Roads.

DIRECTORS OF THE GOOD ROADS ASSOCIATION MEET AT TORONTO.—WORK FOR THE COMING WINTER.

Toronto, Sept. 14.—A meeting of the directors of the Ontario Good Roads Association was held here last evening, Mr. A. Pattullo, of Woodstock, President of the association, presiding. There was a good attendance. Mr. K. W. McKay, of St. Thomas, the secretary, reported favorably on the progress of the association during the summer months.

The object of the meeting chiefly related to the work of the coming winter. The association was formed too late to reach the annual meetings of most of the agricultural bodies of the province, but the friends of good roads have not been idle. Though the public mind was engrossed in the provincial elections during the early part of the year, considerable interest has been manifested in the work of the Association.

Through the department of agriculture about 20,000 copies of the proceedings of the annual meeting have been distributed, while much information on the subject of good roads has been disseminated in other ways.

It was resolved to carry on a campaign of education at the meetings of farmers' institutes and other like bodies. Another provincial convention of the Good Roads Association will be held at Toronto in February next, to which every municipal and agricultural body in the province will be invited to send delegates.

The members of the board of directors say that the question of road reform is taking a deeper hold on the farming community than ever before. Farmers are becoming more and more impressed with the necessity of having better roads.