

or no sewers. There are thousands of places where the benefits conferred by sewers are by no means commensurate with their cost. In populous places—by populous is meant not absolute number but comparative number on a similar area—it will be found that combination and sewage construction will be cheaper than individual drainage or collection. In isolated cases or in straggling villages isolated or semi-isolated treatment will on economic grounds be imperative. Another important matter must be considered before deciding for or against sewers and sewage works, and that is the nature of the natural outfall. When a good fall can be obtained, and land suitable for filtration or irrigation purposes all the year round lies handy, a great deal may be said for sewers and sewage works. But where nature's hand is adverse, and when no fall and no land out of reach of floods can be obtained, the expense of pumping must be taken into consideration.

Few will be found to oppose sewers and sewage works where (1) there is a compact population; (2) a good fall; (3) land at the outfall not liable to be flooded; (4) the separate system. In all such cases sewers by all means, and if a plentiful supply of water can be obtained, water closets.

Old sewage dangers and mistakes must be avoided, and they are chiefly these:

Too large sewers and of defective shape and imperfect materials, *i. e.*, brick, unsocketed pipes, or stone.

Direct communication between houses and sewers.

Defective closets, pipes, and trappings.

Therefore sanitary socketed pipes, ventilation, direct disconnection of houses and sewers, and simple water-closets with ample flush power, must be *sine qua non*s in all new sewage schemes. The treatment at the outfall will depend on local considerations, but utilization by cropping is always to be preferred to mere filtration.

But it may and will often happen that for local and geographical reasons, neither a sewage farm nor even a filter ground can be obtained, or it may be that the isolation of the houses renders the cost of sewer-construction out of all proportion to the benefits received. Still there is the same proportional amount of excrement to be collected and slop water to be disposed of. In these cases the dry-systems come in as friends in need. All that is required with the closets, is uniformity, get-at-ability, and systematic collection. The collection should be made at least once a week, and the sooner the material collected is disposed of the better in every sense. There yet remains the slop-water, and this must be dealt with either locally or in combination. When there is ground attached to a house no difficulty need be experienced. On this point Dr. Cornelius Fox's little book on slop disposal may, with advantage, be consulted.

It must be remembered that the slop or sewage water made by a household is on the average no very formidable amount, and that when it cannot be utilized it may be collected in an iron cesspit or cesspits and disposed of by application to land.