

SEWAGE DISPOSAL SYSTEM FOR A SMALL CITY.

An interesting report lately issued by the Ohio State Board of Health contains descriptions of a number of sewage purification plants in Ohio.

Among the various systems employed for the disposal of sewage, the septic tank has acquired quite a prominent place, and for the last five or six years the practice in this state has largely been to construct septic tanks supplemented by coke, cinder or sand filters.

In connection with this, a description of the sewage disposal of the city of Kenton may not prove uninteresting.

The city of Kenton, O., north district, having a population of about 8,000, lies principally in the watershed of the Scioto river; but the northern district, having an area of about 150 acres, drains northward into a county ditch leading into a tributary of the Maumee river.

A public water supply was introduced in 1883. The average daily consumption is now 700,000 gallons or 175 gallons per consumer.

Nearly one-half the total population are connected with the combined sewers which discharge directly into the Scioto river.

The north district is at present but partly sewered, there being about 400 people connected. Measurements showed that the day flow was at the rate of 35,000 gallons per day, which probably means an average actual dry weather flow of about 25,000 gallons per twenty-four hours. The sewers are principally on the separate system, but receive the surface water from one or two catch basins. The quantity used for flushing is estimated at 1,500 to 2,000 gallons per day. As the charge of sewage from the northerly district into the county ditch would have created a nuisance, disposal works were constructed in 1901 at a distance of about one-half mile north of the corporation line.

The plant consists of:

1st. A septic tank 28 feet long, 16 feet wide and 6 feet deep, holding 21,000 gallons, or about one day's flow in dry weather.

2d. Three dosing filters or "contact filters," which are flush tanks filled with coarse filtering material.

3d. Three beds of pea coke, onto which the sewage is discharged intermittently from the dosing filters.

The septic tank is divided longitudinally by a brick wall and is so arranged that the sewage enters each half at one end and is drawn off at the other end at a point 2 feet below the surface, through small openings into a wooden channel or trough from which it enters the flushing filter by means of inverted siphons.

These flushing filters are 5 feet by 10 feet by 2 feet deep and are filled with a mixture of charcoal, coke and pieces of limestone ranging from one-half inch to three inches in diameter, to a point above the ends of the inlet pipe, which are protected by screens. By raising the end of the outlet pipe any of the three filters may be put out of service.

The principal filters or "wave beds" consist of three long brick and concrete

tanks, each 10 feet by 100 feet, the bottoms of which have a decided slope away from the septic tank, and which are filled with a layer of pea coke 18 inches deep at the upper end and 4 inches at the lower; the coke is covered with a layer of broken stone.

The sewage from the flushing filter discharges against the upper end of the filtering material, and flows through the inclined layer over the whole distance of 100 feet, when it is collected in an effluent channel and conveyed to the county ditch.

The septic tank is no doubt very efficient as a sludge destroyer. After nearly one and one-half years' operation it contains a foot of sludge at the bottom and no scum at the surface. It is said, however, that when surface water enters the tank a scum quickly forms, but disappears when the flow of surface water ceases.

The dosing filters have given some trouble in clogging around the air pipe of the siphon and thus causing continuous discharge on to the main filters.

Very little care is given to the plant; one man visits it three or four times a month, inspects the working of the siphons, and loosens the filtering material at the upper end of the filters.

Analyses of samples of sewage and effluent collected on November 29, 1902, showed a high percentage of removal of organic matter and a well nitrified effluent, but samples collected on September 18, 1903, showed less organic matter was then being removed and that the effluent was not being nitrified.

The cost of the plant was about \$4,000 and the annual cost of maintenance is estimated at \$50.00.—Engineering Review.

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