

## MUNICIPAL DEPARTMENT

### THE SEPTIC TANK SYSTEM OF SEWAGE DISPOSAL.

A contemporary gives the following description of the "Septic Tank" system of sewage disposal which has been successfully established at Exeter, Barrhead (Glasgow), Huddersfield, Taunton and several other places in the Old Country, and which entirely reverses former ideas on the subject.

For the ancient aim of sewage theorists was to destroy the bacteria; the aim of his system is to preserve the bacteria in order that they may consume the impurities, and then themselves go off into gases, which can be utilized for lighting or other purposes. The first ray of light which was thrown on the matter was a suggestion by Dr Dupre that the purification of sewage might be effected, in part at any rate, by the agency of micro organisms. The idea was seized upon by many workers, who sought to embody it in practical form. But the experimental septic tank installation laid down at Belleisle, near Exeter, by Mr. Cameron, during the winter of 1895-1896, to deal with the sewage of a part of the parish of St. Leonard, marks an epoch in the history of this question. The system which it embodies isolated nearly all the recognized causes of sewage treatment. The orthodox mode

of procedure was to throw down the suspended solids by means of chemicals, and to seek to solidify the dissolved impurities, in order to deal with them as solids. Mr. Cameron, on the other hand, liquefied the solids by means of bacteria, in order to deal with them in a liquid form. Decomposition, it was formerly said, must be prevented at whatever cost. Mr. Cameron set himself to promote decomposition. Most important of all, bacteria in sewage must be exterminated. Mr. Cameron did all in his power to cultivate them, for he recognized what earlier experimenters had failed to see, viz., that with a decomposition of polluting matter there can be no change from foulness to purity. The task which he set himself, therefore, was to promote this natural process, and to place it under perfect control. The successful purification of sewage, as might be expected from the number and complexity of its constituents, demands an infinite number of workers, and involves a multiplicity of processes. For our present purpose, fortunately, it will suffice to consider these under two heads. First, the destruction of the solid matters as such, and, secondly, the purification of the dissolved polluting matters. After many years of patient experimenting, Mr. Cameron arrived at the conclusion that the liquefaction of the solid matter would be best effected by the agency of those bacteria which are classed as "anaerobic" — that is to say, which thrive in the absence of air. He accordingly devised for their accommodation the receptacle which is now known as the "septic tank." A septic tank consists of a chamber containing about one day's flow of sewage, more or less, according to the strength of the latter. It is generally covered, and the exclusion of air is completed by the submergence of the inlet and outlet pipes, so as to deliver and draw off respectively below the surface of the sewage. Instead of

filling and emptying the tank alternately, as is done with a precipitation tank, the sewage is allowed to run through it continuously; and it is not emptied from one year's end to another. Although the flow through the tank is continuous, the motion is so slow that its contents are practically at rest, affording ample opportunity for the separation of the solid matter; the heavier substances sink to the bottom, while the lighter bodies float to the surface. Seeing that all these are encouraged to enter the tank, instead of being kept back by screens, as is done where precipitation is resorted to, a thick scum soon forms over the surface of the liquid. The various races of liquefying bacteria are thus afforded the conditions most favorable to their growth and activity, viz., an abundant food supply, darkness, an equable temperature, absence of atmospheric oxygen, and a steady current to wash away the products of decomposition. So well do they do their work that the tank at Belleisle has now been in use for close on four years without requiring to be cleared. The floor of the tank is covered with a fine deposit, largely mineral; but the bulk of this is trifling compared with that of the solid matter which has been brought in with the sewage. The solid matter being thus got rid of, it remains to purify the liquid effluent. This task, like the preliminary liquefaction, is performed by bacteria. These, however, are of quite a different stamp from those which do the rough work in the septic tank. They are accordingly housed in a

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