

THE BACTERIAL TREATMENT OF SEWAGE.

By E. MOHUN, M. CAN. SOC. C. E., M. AM. SOC. C. E., &c.

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MORE than two years ago the writer collected certain data on this subject for the Provincial Board of Health, and has now been asked, since the Report was not printed by the Board, to furnish the information then obtained.

The bacterial treatment of sewage includes various methods of disposal, as by broad or subsoil irrigation, or contact beds, in conjunction usually with screening, or sedimentation, or chemical precipitation, or septic tanks.

As the last has excited much discussion during the last few years, let it be given the place of honour; and the following, relative to the duties to be performed by it, and by the contact bed, has been condensed from a paper read by Mr. G. H. Fowler, M.S.C., F.S.C., at a meeting of the Royal Institute of Public Health.

For the convenience of those who, like the writer, are ignorant of chemistry, the following are definitions of chemical terms appearing in this paper:—

Nitrates contain three parts of oxygen to one part of nitrogen.

Nitrites contain two parts of oxygen to one part of nitrogen.

Free Ammonia is derived from the decomposition of urine.

Albuminoid Ammonia is derived from the decomposition of animal or vegetable albuminous substances.

SEPTIC TANK.

Its Objects.

1. To dissolve as much sludge as possible.
2. To obtain an effluent in which matters in solution are easily nitrified.
3. To obtain an effluent in which there is but little suspended matter.
4. To avoid creating a nuisance.

Its Action.

1. As no bacteria are known which can deal with mineral matter, no road washings, etc., should be admitted to the tank without first passing through a catch pit or grit chamber; and surface and subsoil water should be excluded if possible.

In a new septic tank anaerobic action commences slowly, hence, if the ultimate flow passes in at first, sludge will rapidly accumulate before septic action is established.

2. The primary duty of the septic tank is to so break down and change the soluble matters in the sewage that the effluent is readily nitrified, and, even if but little reduction of sludge takes place, this action alone would justify the use of the septic tank.

It is believed possible that too slow a flow through the tank might produce a putrid effluent, actually poisonous to the nitrifying bacteria.

3. The ultimate product of septic action upon the sludge, besides the soluble substances and the gases, methane or marsh gas, carbonic acid, hydrogen and nitrogen, is a very finely suspended matter, partly of the nature of humus, partly mineral, such as finely divided clay, or sulphide of iron, if iron salts are present in the sewage, and this passes with the effluent on to the contact beds or irrigation area.

4. The residual sludge can be burnt or used as manure; the silt alone is quite innocuous.

5. Covering the tank is not a real preventive of nuisance, unless the gas is collected and burnt.