

in a tolerably pure state, is allowed to flow into the nearest stream.

Sewage farming is clearly becoming gradually more and more popular. In the third Progress Report of the Royal Commission to inquire into and report upon the sanitary condition of Melbourne, just issued, a great deal of evidence in favor of this method of sewage disposal, where suitable soil can be obtained, is brought out, as there is likewise in a report to the French Senate in 1888 by Prof. Cornill, a member of the Senate. While the sewage fertilizes the soil, the earth purifies the sewage. "This it does partly by filtration, partly by oxygenation, partly by the action of growing crops. The solids retained in the soil undergo a slow combustion, partly forming a kind of humus, as in the case of ordinary manures, and partly being oxidized into soluble nitrates, which supply nitrogen to the crops. This oxidation process, which is called nitrification, depends on the presence of multitudes of minute organisms in the soil. These earth microbes exist in enormous numbers, especially in manured soil. At Grenneville (the Paris farm), as many as 900,000 have been found in one gramme (15½ grains) of earth. In the absence of these organisms, the changes involved in the conversion of putrescible nitrogenous matter into plant-feeding nitrates do not occur. Generally speaking, the earth, more than one metre (3¼ feet) below the surface, is free from microbes. Hence, the depth of soil required for efficient treatment of sewage is not so great as was once believed."

The most careful experiments have been made by very able scientists, which prove clearly that no microbes ever exist in the pulp of the crops grown on the farms, nor in the effluent water. Prof. Virchow says that, on the fields which purify the sewage, the pathogenetic microbes are destroyed at the surface by their rivals, the saprogenetic microbes, which are superior in number; in other words, the few germs of disease which reach the surface of the farm are killed in the contest for existence with the myriads of earth microbes.

Nearly one hundred cities in Europe have now adopted this plan of sewage disposal. In quite a number the system has borne the test of time: as for example, for ten years at Berlin, nearly twenty at Grenneville, over thirty at Croydon, and for centuries at Edinburgh. Much if not all the objections to sewage farming have arisen from errors in the application of the sewage. At Berlin, for example, at the outset three times too much sewage was applied to the land and serious trouble was the consequence. Evil results follow when the soil is unsuitable, badly laid out or badly managed. When properly conducted they do not cause offence to the senses nor endanger the health of persons living on or near the farms. Financially, it is thought that if a sewage farm pays or nearly pays the costs of working it has been a success. Many of them do this. The value of the farms is usually greatly enhanced. In the plain of Grenneville, land is now five times more valuable than it was when the irrigation was commenced, while the general prosperity of the plain has greatly augmented.

There are two ways of applying the sewage to the land which may here be noted, namely: Broad or Surface Irrigation and Intermittent Downward Filtration. In Broad Irrigation the sewage is applied continuously, and the lands, when flat, are laid out in gently undulating beds and intersected by a number of open channels for the conveyance and distribution of the sewage fluid. In steep, sloping ground the conveying channels run in horizontal lines, following the contour of the hill face, and are placed 30 to 40 feet apart. Transverse channels of smaller sizes connect the main drains and distribute the sewage over the intervening areas. Beyond a rough surface dressing, the land requires no preparation, and, as a consequence, the outlay is considerably less than in the other process. The drawback is that the sewage is applied continuously and without intervals of rest.

In Intermittent Filtration the principle is to thoroughly drain the land for a depth of 6 to 7 feet, and then lay it out into a