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WATER SUPPLIES.

W. M. WATSON.

In a former article it was intimated that the water supply of Montreal was supposed to be responsible for the high death rate of that city. As therein stated I have never examined into the details of their supply and on that ground I cannot give an opinion, but I will now try to show how a supply can become the cause of an abnormal death rate, and the risk there is in towns drawing their supply of water from drainage rivers, and while doing so I shall partly draw from the works published by Dr. John C. Thresh and Dr. Parkes, both trusted and experienced medical officers of the British Government.

Rivers flowing through very thinly populated districts may yield water to which no possible objection could be taken. Many rivers, however, are utilized as sources of a public water supply which are constantly receiving sewage from towns that are situated above the intake pipe of their own town, and on that account are liable to draw into their own supply poisonous germs ejected from diseased persons or animals.

The Rivers Pollution Commissioners appointed by the Imperial Government to thoroughly investigate such matters reported in the year 1874, that after a thorough examination they had come to the conclusion, that whether they examined the organic pollution of a river at the different points of its flow, or the rate of disappearance of the organic matter contained in the sewage that gets mixed

up in fresh water and incorporated with it by some violent agitation in contact with air, or, finally, the rate at which organic matter contained in sewage is dissolved and disappears in fresh water when polluted with 5 per cent. of sewage fluids, they were in each case compelled to come to the conclusion that the oxidation of organic matters in fresh water caused by introduction of sewage proceeds with great slowness, and they found it impossible to state how far sewage must flow along with the fresh water of rivers before it becomes thoroughly oxidized and harmless.

The city of Greater London draws some of its domestic water supply from the rivers Lea and Thames at a point below where the sewage of a small town is discharged into each of them, yet we are told that the inhabitants who use the water are healthy, and this fact is used to prove that water slightly contaminated with sewage is harmless, but there is a good reason why the polluted waters of the Lea and Thames are wholesome when consumed by the people of London, viz., that after it is drawn from the rivers it flows for over twenty miles in a broad, shallow, open canal which exposes the water to the purifying influences of the air and sun and by so doing it probably secures oxidation.

The characteristics of a good domestic water supply are, freedom from color, odor, taste, turbidity and the total absence of sewage germs and other injurious substances, whether animal, vegetable or mineral. Its appearance in an open reservoir will have a bluish tint. Should a body of water show a yellow-green tint, the water cannot be good, because that color indicates the presence of vegetable or animal matters in the process of decomposition. If the tint be brown it usually proves the water is collected from peaty soils, which may be unpleasant to the eye and taste, yet is generally considered harmless. If water is of a reddish tint, it indicates the presence of iron in the water, which can be eliminated by a process of thorough aeration, which will turn the color to an opalescent appearance, that will settle out of the fluid if the water is allowed to rest quietly in a reservoir for a few days, when the water will become bright and tasteless. Any water that emits an odor when boiled should be classed as unsuitable for a town's supply. Water collected from peat land is very soft and an excellent fluid to use in steam boilers and for washing purposes, but unsuitable for the manufacturing of fine paper, or to be run through lead service pipes, because the acid extracted from the vegetation that grows on peaty soil sets up a chemical action with the lead if allowed to stand idle in the pipe for a few hours, and creates a deadly poison that is delivered at the house drawing taps, and gives the consumers the lead poison which turns their gums and teeth blue and deteriorates the blood.

It is stated in the Massachusetts health report that over 1,400 samples of drinking water were examined, taken from reservoirs, lakes, rivers, brooks, etc., and only 275 of the samples were entirely free from odors. G. N. Calkins, who makes a study of water, remarks that there are three classes of odors that have come under his notice: First,