uprights being filled in with wire mosquito netting and the top roofed over with shingles, the sides having doors for the ingress and egress of the workmen for removing the dried sludge.

This construction would confine the flies to the sludge beds and prevent their wandering into human habitations, and at the same time would allow free access of light and air whilst excluding the rain; the flies could be exterminated from time to time by smoke or other methods.

The severity of our winters has made it debatable as to whether the filters will, without the aid of artificial heat, freeze during the winter months, and to overome this tendency the sedimentation tanks and filter beds have, where possible, been designed under one roof and practically within one enclosure in the hope that the latent heat in the fresh sewage will be sufficient to counteract the frost.

From my personal observations at the septic tanks at Moose Jaw, extending over a period of five years, I found that the temperature of the blanket in the tanks ranged from 40 to 45 degrees Fahr.; the lower temperature being recorded when the air outside the tank registered 40 degrees or more below zero Fahr.; the tanks being of reinforced concrete construction roofed in and covered with a dirt fill of at least two feet on the crown of the arch and increasing towards the haunches and walls.

It remains to be seen whether the latent heat of the sewage will be sufficient to overcome the tendency to freeze in the filters, and I am inclined to the belief that it will, providing proper care is observed in their construction with a view to keeping out the frost. Should the filters, however, show signs of freezing artificial heat will have to be resorted to with its attendant additional outlay and expense.

It is, of course, understood that in locating a site for a sewage disposal plant the topography of the land be well studied with a view to the avoidance of pumping with all its attendant heavy costs, that it be placed as far from the community it serves as possible, and so that the prevailing winds shall carry the odors that will arise, even in the best of plants, away from the city or town.

With this digression I will proceed to describe my imaginary disposal works, which will be typical of those installed in the province up to the present time in conformity with the requirements of the Bureau of Health.

Upon the arrival of the sewage at the works it is received in a screening chamber, passed on into a detritus chamber, thence into a sedimentation tank or system of tanks, from whence it is distributed over bacteriological filter beds, and after emerging, passed into a humus tank where it can be disinfected if necessary before being finally disposed of.

Screening Chamber.—The screening chamber is a small rectangular compartment fitted with bar screens spaced about half an inch apart, the bars being of wrought iron and 1¼ by ½ inch section; in this chamber all foreign substances such as sticks, flannels, scrubbing brushes, corks, matches, hair, etc., are caught and retained and periodically removed and buried or burnt.

Detritus Chamber.—The detritus chamber is rectangular in shape and placed between the screening chamber and the sedimentation tank, being really part of the tank, its capacity is from 3 per cent. to 5 per cent. that of the tank and its functions that of intercepting the heavier mineral matters in the sewage during its passage to the tank.

Were we sure that no sand or other mineral matter would find its way into the sewage, the detritus tank would not be necessary with our separate system of sewage, but we cannot always guarantee that the joints in the tile sewers will remain perfect and it is considered advisable to exclude these substances from the sludge of the sedimentation tanks. The accumulation of detritus is removed at regular intervals through sludge pipes placed at the bottom of the tank, and is subsequently dried and buried.

Sedimentation Tank.—From the detritus chamber the sewage flows over a long weir into the sedimentation tank by means of a submerged inlet, the tank being so designed as to obtain a large sedimentation of the organic matter in the sewage with a continuous flow of the effluent to the filters.

The velocity of the sewage where it enters the screening chamber is three feet per second, but in the tank it is reduced to one-sixty-fourth of an inch per second, which gives us practically quiescent sedimentation with a continuous flow.

The effluent passes out to the collecting channel through submerged outlets, and no scum boards aTe used, as their adoption tends to set up currents in the tank.

The tank I have in mind is divided into two compartments and so controlled by valves that either compartment can be used or thrown out of commission at will, thus enabling us to treat the sewage with different durations of contact, or to empty one division for inspection or cleansing at any time without disorganizing the operation of the works.

The walls and floor are trowelled smooth, the latter having a slope of one in fifteen to the shallow sludge pits, to facilitate the gravitation of the sludge.

The rate of flow through the tank is four and three hours respectively, so that if desired for experimental purposes rates of flow of three, four and seven hours can be obtained. The amount of dried sludge extracted from the tank per capita per day is approximately two ounces, depending, of course, largely upon the habits of the persons contributing to the sewage, and as this is increased in bulk nineteen or twenty times by the large amount of water mixed with it, being approximately in the mass 90 degrees to 95 degrees water, weekly extraction of the sludge is necessary to keep the effluent fresh.

For this purpose sludge pipes controlled by cone-shaped valves are carried from the bottom of the shallow sludge pits to the sludge beds, where the sludge is regularly deposited and dried during the seasonable months.

The tank is easy of approach and is fitted with gangways inside so that inspection is at all times easy and can be accomplished without climbing down dark and dirty manholes, or soiling the hands or clothing.

The tank is of reinforced concrete and roofed in as is indeed all other parts of the plant, and a thermometer is kept constantly suspended in the sewage to show the degree of temperature.

The outlet of the tank is fitted with a measuring weir so that the production of sewage can be tabulated and recorded.

Bacteriological Filter.—After passing the measuring weir, the clarified effluent is conducted by a main channel running lengthwise along the centre of the filter, from which subsidiary channels branching off at right angles lead it to a system of Stoddart trays by means of which it is distributed over the filtering material in the form of fine rain drops.

The trays discharge at three inches above the filter, so that no splashing occurs and are laid perfectly level by means of thumb screws affixed to wrought iron chairs.

This method gives a very satisfactory distribution of the effluent and the Stoddart trays have the added advantage of requiring but little attention.

The filtering medium is composed of three-inch crushed stone, well screened and free from dust, and has an average depth of 8 feet, for treating the effluent at the rate of 150 Imperial gallons per cubic yard per 24 hours.