

24. As a first step, Mr. Porter prepared a "Memorandum on Basic Technical Data" (dated 9th September) in which he discussed, and made proposals in connection with, the topographical features of the Metropolitan District, the estimated ultimate population of the district and its distribution, the volume of sewage for which sewers and treatment-works should be provided, the location of treatment-works, and the treatment and disposal of trade wastes. Copies of this memorandum were sent soon after its preparation to all the local authorities concerned and to certain other authorities with a request for their comments on its contents.

25. On 15th December, Mr. Porter submitted to the Board a full report on the further investigations made by him following the Board's instructions of July, 1948. This report covered all aspects of the drainage problems of the Metropolitan District, and showed the importance of the results of the investigations which had been made since the year 1946 into the quantities and quality of the trade wastes which are being discharged into sewers and harbour waters. The subject of trade wastes will be considered in a later part of this report. For the present purpose it will be sufficient to give the following brief summary of Mr. Porter's report :

- (1) The disposal of sewage on land is rejected as entirely impracticable.
- (2) Disposal to the Tasman Sea is also rejected because of the excessive cost and the loss of valuable by-products involved.
- (3) After examining five possible sites for treatment-works, those at Motukorea, Mangere Peninsula, and Southdown are considered to be practicable and the others unsuitable.
- (4) The scheme proposed by the Drainage League before the parliamentary Select Committee in 1946, which provided for a single treatment-works on the Manukau Harbour, the cultivation of water-hyacinths in an effluent lake situated above the Mangere Bridge, and the composting of the hyacinths, sewage sludge, and town and industrial wastes, is considered and rejected because of the unduly high capital and operating costs and also because it is considered that the practicability of the cultivation of water-weeds in purified sewage effluent and their harvesting is too uncertain to warrant its adoption as a main feature of a sewage-disposal scheme.
- (5) The disposal of sludge at sea under the present and the probable future conditions is considered to be likely to be more expensive than a system of full treatment by modern methods with the resulting production of a valuable fertilizer.
- (6) The method of treatment of sludge recommended (which would produce an organic fertilizer of high market value capable of being increased by the addition of potash and other mineral salts) comprises —
 - (i) Digestion in heated tanks with production of gas of high calorific value.
 - (ii) Decanting of liquid from digested sludge.
 - (iii) Air-drying of digested sludge on sand-beds.
 - (iv) Pulverization of air-dried sludge at high temperatures.

It is considered that, while the capital and operating costs would be high, they should be almost completely offset by the fuel value of the gas (to be used mainly on the works in lieu of Diesel oil) and by the sale value of the fertilizer produced.

- (7) For economic and other reasons the disposal of sludge by composting with town refuse, vacuum filtration, and other alternative processes are not recommended. It is considered that the disposal of organic town refuse is the responsibility of the municipal authorities, and that if they wish to adopt a sludge-refuse composting process they should be given the opportunity of buying dried sludge for use as an activator.