

kind of treatment; it is considered all right to discharge raw sewage into the creek or river or lake, as long as the waterworks intake pipe is up-stream and the sewer outlet down-stream; or, in case of a lake supply, a couple of miles apart; but when the death rate rises up to uncomfortable figures, then the first question asked is: Have we got a pure water supply? The overworked, busy city engineer has worried over this question in idle moments, between midnight and sunrise generally, and has, perhaps, formed an opinion of what steps should be taken to safeguard against contamination of an existing pure supply, or procure a better supply than one already contaminated. Sound advice to the city engineer is: Get your council's permission to employ a consulting engineer of known repute; lay all your information, together with your own opinions, before him, and then let him decide what should be done. It is well-spent money to employ the consulting engineer, and when he has worked out the project, and it proves a success, give him the full credit for it, although you have furnished him with some useful information; because, if his scheme does not prove an unconditional success, he gets more than his full share of the blame.

Sewage Disposal.—Once a pure water supply has been secured, the engineer must turn his attention to the sewerage system, as this problem is of equal importance to the public health; not alone in his own town or city, but to all the inhabitants of the drainage area further down the stream or bordering upon the lake into which the sewage is being discharged. It was considered sufficient once upon a time to discharge the sewage raw into a flowing stream or a fairly large lake, and then trust to Nature for the rest; but Nature fails to respond to our trust, and we engineers are obliged to erect sewage disposal plants, a better name for which would, by the way, be sewage treatment plants.

This treatment of sewage in such a manner as to render it harmless is probably the greatest problem of modern engineering authority, and one that should not be tampered with, because a poorly or wrongly designed plant is worse than no plant at all. The province of Saskatchewan is to be congratulated upon the way in which this important problem is being dealt with. The Provincial Government has very strict rules regarding this subject. They employ their own experts, whose advice can always be obtained in designing a system, the plans of which must be approved by the government.

In connection with this matter there is one feature which could possibly be made a subject of recommendation to the government, and that is the operation of these plants after they are installed. No matter how scientifically a plant is designed, nor how properly it has been constructed, if a properly trained and enthusiastic man is not placed in charge of the operation to take proper observations of the results and see that proper results are obtained, the plant will be a dismal failure.

The conviction forced itself upon me, while city engineer in Moose Jaw, that the government ought to place a scientifically trained person in charge at each plant and contribute a portion of the cost of his salary as well as the cost of an experimental station, so that complete and reliable records could be obtained regarding the operation of the different plants.

Garbage Destruction.—Assuming, now, that an ample supply of pure water has been secured, and that there is in operation a plant where the sewage is being treated so successfully, that it ceases to be a menace to the

public health. The system of collecting and destroying garbage is another important question. It is not exaggerating to claim that inside the limits of every city in Canada there are always hundreds of tons of garbage lying in a more or less advanced state of decay with the resulting dangers to children and adults. The air is poisoned by the emanating odors, but in spite of all this some cities are very careless and indifferent towards the garbage problem.

Here is a broad field for the engineer to organize a proper system of collecting garbage regularly and then also destroying it properly. When a town has grown to a size of 15,000 inhabitants, it can afford, and should erect, a garbage destructor which, when properly constructed and carefully managed, can be operated at a reasonable cost. The incinerator, which was erected during my stay in Moose Jaw, cost about \$45,000, and had a capacity of 50 tons per 24 hours. It was operated without the use of any coal and developed enough steam for 50—75 h.p.

The most essential problem in connection with garbage is, however, to educate the public to co-operate with the authorities by reducing the garbage to a minimum, instead of having an abundance of barrels and boxes in the back yard filled to overflowing. There is no reason why the average household could not dispose of most of the garbage in the ordinary stove and furnace; the ashes can and should be kept separately and used for filling purposes; tin cans, when emptied, should be rinsed with water and then put on the bonfire, where it is permitted to have bonfires.

My attention has lately been called to a water-heating garbage burner, which is manufactured in Kewanee, Ill., and can be installed in ordinary private houses for from \$150 to \$250. It is claimed for this apparatus that it will destroy all house garbage and develop sufficient heat to provide hot water for domestic purposes. The municipal engineer should investigate such matters, and advocate their introduction in hotels, boarding houses, large private and public institutions, hospitals and asylums.

In smaller cities, which have not reached the stage where they can afford incinerators, the nuisance ground flourishes, and is generally very badly managed or not managed at all, but simply left as a perfect Gehenna. There is no necessity for such a state of affairs, as a nuisance ground, under proper management, can be made a smaller pestilence than at present by the display and use of common sense.

Fires should be maintained; a system of ditches should be dug, into which garbage that can not be destroyed in the fires can be dumped and afterwards covered with the excavated earth. On the average nuisance ground we can generally find enough combustible material, in shape of paper, rags and boxes, to maintain fires which will burn most of the garbage, or at least disinfect it, and in charge of the place are some old fellows who have been given that job because they are old rate-payers.

City Beautification.—But let us turn away from all this and consider the more pleasant tasks of the engineer, through which he promotes the comfort of his fellow-citizens and beautifies the city. These comprise matters such as building sidewalks, curbs, pavements, boulevards, parks and tree-planting. It is of comparatively small importance whether the sidewalks are laid at the property line or at the curb, as far as the public health is concerned; the main thing is to get a network of sidewalks