

## REFUSE DESTRUCTION.

By R. O. Wynne-Roberts,  
Consulting Engineer, Regina, Sask.

[NOTE.—This very interesting paper was prepared by the author for presentation at the Convention of the Canadian Public Health Association, to have been held in Fort William two weeks ago, but which was cancelled owing to the European strife.—EDITOR].

ONE of the primary duties of a municipal authority is to dispose of the waste products of a city, quickly, hygienically and economically. Such duty, however, is a somewhat difficult one to carry out, sometimes. The satisfactory disposal of sewage, for example, has engaged the attention of specialists for many years, and it must be acknowledged that in a great number of places the efforts to efficiently treat sewage have more or less been failures, for a satisfactory effluent is to be found in only a few places. Yet, a solution must and will be found for this problem, and meanwhile communities are perforce to adopt the best available process.

In the matter of refuse disposal, the situation is somewhat dissimilar, for a large number of towns have surmounted the difficulties with good results.

The temptation is to dispose of the refuse by the easiest, even if it is not the most sanitary, means. Refuse tips are plentiful, but the modern tendency is to abolish such dumping grounds as are used without discrimination, and adopt some other method. It is somewhat late in the day of advanced sanitation for filth to be deposited on the outskirts of a city without care or consideration and thereby be an annoyance to the people who are dwelling in the neighborhood, if not create a menace to the public health.

Town refuse consists of such a heterogeneous mixture, it varies in every load, every day and in every place. In cooler climes there is a larger proportion of ashes, whilst in warmer latitudes vegetables and other refuse will be more pronounced. Refuse from towns in districts of high rainfall and humidity will probably be more moist and resistant to fire than in districts of low rainfall and humidity, in spite of the receptacles being usually covered.

The quantity of refuse produced per capita in Europe is less than in America and as a rule no division is made for the purpose of collection.

In America, town refuse is often divided into three main classes: garbage, which "consists of organic waste or residue of animal, fruit or vegetable matter, and any matter or substance used in the preparation, cooking, dealing or storage of meat, fowls, fruit or vegetables"; ashes, which "constitute waste due to the combustion of coal or other combustible material, from residences, manufacturing or business places and consists of fine ash, clinker and unburned coal"; rubbish, which consists of discarded and useless waste matters from residences or places of business not classified as garbage or ashes, such as paper, straw, excelsior, rags, bottles, old clothes, shoes, tin cans and other like waste materials."<sup>1</sup> There are other refuse such as manure, street sweepings, dead animals, night soil, sludge, etc.

In America, the collection of town refuse is often made separately for each class named. Separate receptacles have to be provided and the contractors or the municipal authority make periodical calls to remove each class of refuse. Much depends upon the frequency of such collections, as to the cost of the work and the ef-

ficacy of this system. Daily removal by municipal forces will obviate practically all nuisance, and if rightly organized a combined collection can be as economically done, if not more so, than insisting on the wrapping of garbage in paper and the separate collection at less frequent intervals. It can be easily understood that the separation of garbage, ashes and rubbish entails the loyal support of the householders and the ordinary experience is that the simpler the duties imposed upon the householders and others, the more likely they are to be performed.

The common method of refuse disposal is by dumping it into depressions or pits or on waste land. Reference has already been made to this and it is therefore necessary only to state that progressive authorities are becoming more insistent that such a method is not desirable in well-governed cities, unless due care is taken to cover the refuse with earth or other deodorant.

The disposal of garbage on pig farms is repugnant to the minds of all citizens having a high regard for the welfare of the people, and for the production of food by clean methods. It is stated that about 75 pigs are necessary to dispose of one ton of garbage daily.<sup>2</sup>

In Los Angeles, Cal., the garbage piggery was investigated by the Grand Jury. They reported that "the investigation of this Grand Jury shows that at the present time (March, 1912) there are located on the hog-ranch about 21,000 head of hogs; that the percentage of death of the hogs ranges from 40 to 65. We find, further, that the percentage of tubercular hogs on this ranch ranges from 10 to 20. Of this number two per cent. are condemned by the health officials, the other portion being placed on the market. We further find that cholera, strike, swine plague or swine fever is prevalent at the ranch at all times. In fact we find that at the present time this hog-ranch is quarantined for all purposes except for the purpose of slaughtering for food."<sup>3</sup>

It is palpably unnecessary to add to the foregoing indictment. The writer is unaware if this practice prevails in Canada.

It may be stated that a contractor has recently been awarded the contract for the disposal of the garbage of Los Angeles by means of a garbage reduction plant. The city is to receive 51 cents per ton for the garbage.<sup>3</sup>

Two cities in the United States own garbage reduction plants, namely, Columbus and Cleveland, Ohio. There are other cities where contractors have erected reduction plants to deal with the garbage of these cities.

This method was first introduced in Germany (where, curiously, it is not much used to-day) and later on it was introduced into the United States. It is similar to the plants installed in packing houses to dispose of the offal and to convert it into saleable by-products. Some of the reduction plants are operated on the "drying method," but the "cooking method" is stated to be the most satisfactory. The process consists of placing the garbage in steel digester tanks, and when about 10 tons are so disposed of, the valves are closed and steam is admitted. After a few hours' cooking, the mixture is pressed to extract the free grease and the moisture. The solid matter is then dried and afterwards saturated with naphtha, gasoline or other solvents to dissolve the remaining grease. The solvent is recovered by distillation and the grease and tankage is sold to buyers, who refine the

<sup>1</sup> Report of the City Waste Commission of Chicago, 1914.

<sup>2</sup> Refuse Disposal in Small Cities and Towns, by Samuel A. Greeley, Illinois Society of Civil Engineers, 1913.

<sup>3</sup> Journal of Cleveland Engineering Society, March, 1914.