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THE DESTRUCTION OF HOUSE REFUSE BY INCINERATION.

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The question of the sanitary disposition of house refuse is one which is exercising the minds of those in civic control of the large cities throughout this country at the present time, and it is a problem which demands the closest attention and most active administration in order to lessen the rate of typhoid and other diseases.

The common house refuse dump is the germinating centre of the house fly, and the house fly is the most serious carrier of the germs of diseases such as typhoid, tuberculosis, infantile diarrhoea, etc.

To quote from a circular recently issued by the Department of Agriculture, Canada:

"House flies breed in such decaying and fermenting matter as kitchen refuse and garbage. . . . All such refuse should be burned or buried within a few days, but at once if possible. . . ."

The burying of refuse is a proposition which cannot be entertained by the larger cities, as large areas of ground would be necessary for this purpose, so that the city has to prepare for burning its refuse.

To effect this the incinerator or refuse destructor is requisitioned.

Before getting into the subject real of this article it will be necessary to define the term house refuse and to subdivide it so as to agree with the general practice in Canada.

The term "house refuse" is an "old country" one, including as it does the whole of the refuse from an inhabited dwelling, excepting faecal matter.

Strictly speaking such items as slaughter house offal, dead animals, street sweepings, trade refuse, and industrial wastes are not included.

In Canada, where American terms have become general, these matters are divided under three heads, viz.: Garbage, rubbish and ashes. These are generally held to include the following:

"Garbage" includes all refuse of an organic nature, consisting of food wastes or swill.

"Rubbish" includes all combustible matter, such as paper, wool, rags, leather and house sweepings, also glass, iron, crockery, and such like.

"Ashes" includes household fire, kitchen fire, and heating furnace ashes. (Factory, industrial or boiler ashes are not included.)

Items not included are faecal matter, slaughter house offal, dead animals, street sweepings, and sewage sludge.

The matters which come under the head of "garbage" are those which give rise to insanitary conditions. Rubbish and ashes do not offend in this respect, so that the question before the engineer is really the disposal of "garbage" by incineration. The first question to decide in the formation

of a scheme for house refuse disposal is that of subdivision of the matter. Garbage has to be burnt, rubbish may either be burnt or dumped, and ashes may be required to assist in the combustion of the garbage or may be entirely dumped. Probably the best method to adopt is to burn all garbage and rubbish, and dump all ashes excepting a certain amount required for assistance in combustion. Such a plan would require the division of the receptacles at the house into two compartments, one for garbage and rubbish, the other for ashes.

The matter of division, however, becomes somewhat altered where power is to be developed at the incinerator plant, as in this instance it is essential to have the ashes incorporated with the garbage and rubbish. Whether the whole or only part of the ashes are required to produce high temperatures is a question which has no general solution, but which must be decided upon investigation. The fine ash dust is however of very little value as a fuel, so that it would be necessary to screen the ashes and use only the larger.

The incinerator plant which will be discussed in this article will include the boiler and its appurtenances for the production of power.

Having arrived at some conclusion (as definite as can be with regard to the changeable characteristics of the material to be dealt with) as to the necessary subdivision, the question of quantity has to be decided.

Canadian households produce far more house refuse than those in the "old country." This is probably due to the absence of open fires which would receive and destroy a good amount of waste and also to the fact that thrift is less practical here. Be the cause what it may, the quantities given in data furnished by English cities are of no use to the engineer designing a plant in Canada.

An instance of this may be cited. In England a town of 36,000 people produces about 66 to 75 cubic yards of refuse (garbage, rubbish and ashes) per day, whereas in Westmount, Que., the population is 18,000 (half the population) and the production is between 80 and 103 cubic yards per day. An average for the large American cities is 57.7 cubic yards per day for a population of 18,000. These comparisons are given not so much as guides for the engineer but to warn him that it is essential to ascertain the amount of refuse the town or city produces actually.

In spite of the fact that quantities of house refuse vary considerably as between different towns or cities, the general composition remains reasonably constant, so that data as to the calorific value can be applied (within certain limits) to the design of furnaces and boilers for generating certain powers.