tion. In such a plant it is extremely difficult if not impossible to prevent the emission of objectionable odors, and as a rule these plants are located on the extreme outskirts of a city, an admission of the nuisance liable to be created.

The most valuable product of a reduction plant is the grease extracted, and to carry the process to its greatest refinement a percolating equipment employing naphtha in large quantities is used. This constitutes a constant menace to life and property, the destruction of plants at Chicago, St. Paul and Paterson affording examples of the dangerous character of this industry.

A reduction plant can only handle organic matter, and the contents of the receptacle of the careless householder who does not make a complete separation must go to the dumps or be otherwise destroyed by other means.

The conditions described as favorable to the installation of a reduction plant do not obtain in Newark, and the only feasible location for such a plant would be one well removed from the occupied ground on the meadows, this involving a long and expensive haul.

The cremation system or burning of garbage at comparatively low temperatures does not completely consume the organic matter, gives forth objectionable stack odors, and is generally an unsatisfactory method which does not comply with sanitary requirements for installations on a larger scale. For hotel or apartment houses where the fuel used and gases given off may be used in supplying the heat for a hot water supply system, higher temperatures may be carried, but in the case of larger installations the fuel cost for high temperature combustion would make this method prohibitive.

Incineration differs principally from cremation in the temperatures obtained in combustion, and although, like cremation, it requires the use of additional fuel, it is nevertheless a satisfactory method of refuse disposal for those municipalities which are content with their partial success in the enforcement of separate collections and the more or less objectionable ash dumps containing garbage mixed with the ash. It only partially solves the sanitary phase of the problem of refuse disposal, leaving the household ash to be carted to the dumps, and it is well recognized that a perfect segregation of the garbage from the ash is impossible of attainment, as evidenced by inspection of dumps where this system is employed.

The destructor system has previously been defined in this report as the burning of ashes, rubbish and garbage at temperatures above 1.250 degrees Fahr., but this definition should be amplified to include the requirement of artificial draft as a necessary adjunct to a high rate of combustion. This system is generally favored where it is desired to utilize the power developed by the refuse consumed, but it should be kept in mind that the utilization of surplus heat is of secondary consideration, and that the primary object of mixed refuse destruction is to completely reduce the material to an innocuous clinker.

Although this utilization of heat often reduces the cost of upkeep of plant, it should nevertheless be remembered that the principal result obtained in this system is a sanitary one, affording complete destruction of germ life in all classes of refuse with entire absence of objectionable odors.

The disadvantages are few and mainly due to improper design and faulty administration. The claim is sometimes advanced by engineers that the hauling of all refuse to the plant is one of its disadvantages, but we hold that this is more than counter-balanced by the fuel value of the ash and combustible waste in the destruction of the garbage. For excessive hauls, where the expense of hauling the ash alone exceeds the cost of fuel delivered at the plant, their contention is correct; but where the haul to the plant is as costly as that to a dumping ground, or where it is practicable to maintain several plants and thereby reduce the length of haul, this argument cannot be upheld.

Another objection urged against the destructor system is the necessity for expert firemen, the stoking of refuse, which has wide variations as a fuel, requiring the exercise of greater skill and judgment than is the case in the stoking of coal of uniform heating value. In our opinion this argument is fallacious and based upon a very low conception of the grade of intelligence possessed by the competent stoker of boiler fires, who, in addition to his duties in stoking, is required to maintain a uniform pressure of steam and a stationary water line.

The advantages of this system of refuse disposal are many and have been most forcibly impressed upon us by inspection of the various types of plant. We list in the following the principal advantages:

First. The destruction of all organic matter in an absolutely sanitary manner.

Second. It permits the destruction of the ashes, rubbish, garbage and street sweepings, reducing all to an innocuous clinker.

Third. The fuel is supplied by the ashes, rubbish and street sweepings.

Fourth. The heat generated in combustion at high temperatures can be utilized in the production of power from which an income may be derived. A revenue can be obtained from the sale of clinker.

Fifth. A city can operate more than one plant with economy, which is not feasible in the reduction system. This permits of shorter hauls and reduces the risk of interference by fire or the failure of a part of the equipment.

Sixth. Separate collections are not necessary.

Seventh. The class of labor required in the operation of the plant is not as skilled as that required in the reduction system.

Eighth. The cost of renewals and repairs is considerably smaller than in other types of disposal plants.

Ninth. The plant may be located in the centre of the city without creating nuisance, experience at Westmount, Canada, and West New Brighton, N.Y., fully demonstrating this fact. This feature makes the system particularly desirable for Newark, where locations within the city limits would materially reduce the hauling cost

CONCRETE MONOLITHS.

A system for the construction of monoliths being employed in connection with harbor work at Valencia embodies the use of moulds in the form of truncated pyramids measuring 28 feet square at the bottom and 26 feet square at the top, with a height of 26 feet. The bottom of the mould is constructed of wood and the sides of iron, and the mould is built so that the sides and bottom may be detached from one another. In operation the mould is assembled and is floated into sheltered water close to the site of the construction work. It is then partly filled with concrete by means of a crane, and is towed to the position to be occupied by the monolith, where the filling is completed. After the filled mould has been left in position for ten days the fastenings are released and the sides are raised in order to be fitted to a new bottom for a repetition of the process. The advantages claimed for this system include low cost, speedy construction, adaptability to curves, and homogeneity.