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remainder of the process is simply one of transportation. A centrifugal pump is employed to create a rapid flow through the pipe from the point of excavation to the point of discharge and the solid matter is carried along with the water. In view of the fact that the percentage of solid matter is small and the volume of the water transported is large, it might be supposed that this method of dredging would be a very wasteful one, but there are several other incidental advantages gained at the same time and in the light of practical results the process is not so wasteful as it seems. In the first place, the essential feature of this type of dredge is the disposition of the material, and, therefore, in comparing the results of its work with any other type, the cost of disposing of the material as well as dredging it must be included. It is also especially adapted for filling up and reclaiming low lands, and, in work of this kind, the presence of a large volume of water with the discharged material is a great advantage as it serves to distribute it over a large area while the water is flowing off.

The velocity of flow in the discharge pipe of dredges of this type varies from eight to sixteen feet per second, and different kinds of material require different velocities of flow for the most efficient work. Material like clay or soft mud can be transported at a slower velocity than sand or gravel material, which tends to quickly precipitate. A high velocity of flow means a greater friction in the pipe and pump, and, consequently, greater expenditure of power. It must always be borne in mind that a fluid mixture of sand or mud and water is heavier than water alone and, therefore, takes more power to pump it against a given head, and, also, the friction in the pipe is greater.

In the earlier hydraulic dredges great trouble was experienced with the abrasion and wear of the interior of the pump. As the first pumps used were similar to centrifugal pumps for water only, it was not an infrequent occurrence for the pump to be renewed after three or four weeks' work. By successful improvements, however, we have been enabled to increase the durability of the pump so that, under ordinary conditions of service, they can be made to last two or three years and, in fact, the principal parts of them are now so designed as to last indefinitely with the parts subject to special wear arranged to be renewable. The interior of dredging pumps are now made of cast steel instead of cast iron as formerly. This is not, however, on account of the greater resistance to abrasion of cast steel as compared with cast iron, because