

NEW YORK HARBOR AND SEWAGE TREATMENT.*

After describing the various sewer outlets into the rivers and harbor, it is stated that samples taken from the bottom of the lower Hudson River and various portions of New York Bay appeared to be sewage sludge, in a fairly advanced stage of decomposition. It is found as far out as the inner end of Ambrose Channel; it diminishes rapidly in volume toward the crest of the bar, and at the outer end of the channel the material dredged up appears to be clean sand.

Much evidence was found that near the mouths of sewers, under the piers, and in partly enclosed waters surrounding the harbor, the deposits of sewage sludge are great enough to require dredging at intervals, and at places the waters are so badly contaminated as to constitute a nuisance. On the other hand, in the open harbor and bay, but little inconvenience has as yet been felt. Colonel Black quotes evidence given by the engineers of the Passaic Valley Sewerage Commission that surface water in summer at ebb tide at Robbins Reef contains 88.5 per cent. of the normal quantity of oxygen, while the condition of the water will not be serious, it is, stated, until the oxygen is reduced below 50 per cent. of the normal. From the viewpoint of the general shoaling of the harbor to be produced by the sewerage projects, it is considered by Colonel Black that the increased cost of dredging the deposits from the navigable channels amounts to less than the cost of disposing of the sewage in some other manner.

The pollution of the waters of the harbor to an extent that would be prejudicial to commerce as well as to the interests of the people living and doing business along its shores is more important than the matter of shoaling, according to the report. After an examination of the evidence at hand Colonel Black accordingly stated in his June report that the untreated sewage from the Bronx Valley sewer could not be poured continuously into the river at a single point without creating a local nuisance, although the volume of water in the Hudson is sufficient to deal ultimately with such a discharge. He accordingly stated that a tank should be built of sufficient size to contain the total discharge for one day. This should be arranged to allow facilities for screening, sedimentation and septic action. In addition to this, the effluent could be further purified, he believed, by aerating it with air forced into the outfall pipes under some pressure. The outfall sewers should be arranged to distribute the sewage in deep water over a comparatively large area through numerous outlets. As the population increases, new tanks can be added, but in case permission for this type of disposal is granted the permit should carry with it the condition that the sewage which is discharged into the river should always have a given minimum standard of purity.

In the report dated October 4th the conclusion is reached that the purification of sewage before its discharge into the harbor, on the ground that it may contaminate shell-fish in waters receiving it, is not advisable. These waters are seriously contaminated by surface wash from all the populated areas surrounding the harbor, so that the complete purification of all sewage would not render them free from objection. The complete purification of sewage in thickly-populated districts along the water front is considered impracticable, owing to the excessive cost of the property necessary for the purpose. The problem, therefore, is to attain such a degree of partial purification of the sewage that its subsequent discharge into the harbor will not make the latter offensive.

*A digest from the Engineering Record of two recent reports.

Colonel Black has accordingly recommended that sewage discharge should be permitted only under the following conditions:—

(a) "The sewage effluent before discharge shall be purified to such an extent as to contain in a putrescible condition not more than 75 per cent. of the organic matter found in average American sewage, as described by Winslow & Phelps on pp. 13 et seq. of their "Report of Investigations in the Purification of Boston Sewage," published in Water Supply and Irrigation Paper No. 155, of the U.S. Geological Survey.

(b) "No solid material shall be present in the sewage at the point of discharge excepting as matter in suspension, and the particles of solid matter then in suspension shall be so small as not to be clearly noticeable when the sewage in a diluted form has reached the surface of the water near the point of discharge.

(c) "There shall be no escape of noxious gases at the surface of the water at the point of discharge.

(d) "No sleek shall be apparent at the point of discharge.

(e) "The discharge shall be so distributed as to cause no apparent discoloration at the surface of the water.

(f) "It shall be further stipulated that, should a sewer be built and operated under these or similar conditions, the officials legally charged with the construction and operation of the said sewer system shall, whenever so required, furnish to the proper official or officials of the United States designated by the Secretary of War such expert and other assistants as the representatives of the United States may deem necessary to determine whether the conditions are being complied with."

CONTROL OF WORKMANSHIP ON ASPHALT PAVEMENTS.*

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(Continued from last week.)

This, in the course of years is absorbed into the top, softening it and resulting in displacement or grinding out. The only test of a good open binder is that it should appear, on close inspection with the eye, to be uniformly and well coated, and when rolled and cold, should sustain the traffic incidental to laying the top without breaking up. With closed binder, there is not so much danger of separation of the cement, but the point most generally overlooked is in getting a uniform amount of fine material mixed with the stone, and this can be accomplished only by receiving the stone and sand in separate bins and mixing them in uniform proportions. This material, when laid and compacted, should, on breaking, appear solid and well filled, but not over-filled.

The proper proportioning of the materials entering into the wearing surface presents the most difficulty, for the reason that the amounts of asphalt cement, filler and sand vary and are interdependent upon each other, according to the characteristics of each material. Failure to recognize this fact, and work by rule of thumb, has produced many unnecessary failures. Density, toughness and elasticity are the characteristics to be sought for in preparing a durable mixture, and wide latitude is usually allowed the contractor in producing this result. Unfortunately, such latitude often leads the contractor to economizing on such materials as increase the cost, so that it is much more satisfactory to

*From a paper in the Michigan Technic.