

running from 85 to 95 per cent. This is a material which is fairly liquid.

The only permanent remedy, Mr. Pearse states, is to prevent deposits. The dilution available, however, may require further treatment. To-day, screening is available where the areas tributary are relatively small and the sewage fresh, and in case screening be not sufficient, various styles of sedimentation tanks, either of the single or double-deck type, can be used to advantage.

It is difficult to state any hard-and-fast criterion that will cover all cases. The amount of dilution affords one key. Mr. Pearse suggests that where a stream is large and the dilution great, so that oxygen is always present to a high degree except in the vicinity of the sludge banks, dredging may prove an appropriate remedy. This is particularly true when the velocities of flow are sufficiently high to keep the settling material moving at other points.

Comparison on the basis of the cost per cubic yard of dredging and of sludge collected in tanks, is difficult. Roughly speaking, per cubic yard of material handled, dredging has the lower cost price. The total annual cost per cubic yard of sludge collected in a sedimentation plant, with Emscher tanks, would be considerably higher. The effectiveness and scope for application of sedimentation plants is, however, quite distinct from that of dredging.

The conclusions are: (1) Sludge deposits may form when velocities of flow are low. (2) The effect of sludge deposits is governed somewhat by dilution; nuisance may exist, locally, even though dilution be very great. (3) Sludge deposits will use up oxygen from the supernatant liquid. (4) Three remedies are available: dredging, by-passing the locality, and the removal of suspended matter before discharge. (5) Dredging is efficient as a cleaning-up process; it is not a permanent remedy, in that it may not reach all material, and is executed at infrequent intervals. (6) By-passing the locality is a temporary expedient, which may relieve present conditions and perhaps cause trouble later elsewhere. (7) The removal of suspended matter by screening or sedimentation is effective, and of permanent service. (8) Screening will remove the coarser material, the results depending very largely on the character of the sewage. (9) Sedimentation will remove practically all the settling suspended matter. (10) Effectiveness and cost must be balanced to suit physical conditions.

STREET ENCROACHMENTS IN TORONTO.

The question of street encroachments was the subject of a report by Mr. T. D. LeMay, O.L.S., the city surveyor of the city of Toronto, to the City Council. The text of the report is as follows:—

The problem of enforcing strict adherence by architects and builders to street lines as defined by registered plan, by-law or otherwise, is one which merits immediate attention. Instances of encroachment on public thoroughfares are comparatively common, some of them undoubtedly due to ignorance, others the result of carelessness or wilful disregard of the limits of the street as defined by an Ontario Land Surveyor. Attached hereto are three sketches of encroachments of this nature that have recently come to my knowledge, and which, in my opinion, should be the subject of firm action by the proper official. The general question of taking such steps as will obviate similar occurrences in the future could be solved by the employment of an official whose duties would be the definition of all street lines in the city for those erecting buildings, and the detection of encroachments that have been created by the erection of buildings of comparatively recent date. The infor-

mation at present in this office being of such a meagre nature, would involve unlimited access to the field notes accumulated by the old established land surveyors of the city, which are, of course, their private property, and which they would not be prepared to throw open to the inspection of such an official, whose duties must very appreciably interfere with their practice, especially in the case of the older portions of the city, where the side lines of the lots are to a certain extent defined by possessory boundaries, and where the location of the street line constitutes for the purpose of the builder the whole survey. It might, of course, be possible to arrange some fee to be paid for each copy of notes taken, amounting to from \$5 to \$20 each, which, estimating the number of permits for 1912 at 8,000, would amount to a very considerable sum in the course of a year, even if the city were only called on to take action in, say, one-third of that number; and further, estimating at the rate of ten surveys a week for each such specially appointed official, it would be necessary to employ about six fully qualified land surveyors and a similar number of assistants, with an aggregate expenditure for salaries of about \$14,000 per annum. The cost in this case appears to me to be prohibitive, and after careful consideration I would strongly recommend as an alternative that a by-law be passed enacting that every person applying for a permit to erect a building, any portion of which is designed to be at a less distance than two feet from the street line, or a building on any street upon which the building line is fixed by by-law, shall be required to hand to the City Architect simultaneously with his application, a plan of survey, made by an Ontario Land Surveyor, showing clearly the street line with reference to the kerb or some other permanent offset point. These plans to be forwarded to this office, where they could be placed on record with other information of a like nature. It would then be the duty of a specially appointed permanent official, being a duly authorized Land Surveyor attached to this office and working under my supervision, to check by means of the information given on the surveyors' plans the position of such buildings with regard to the street line or building line. A further duty of such an official would be to look out for and make careful enquiry into any apparent existing encroachment, and generally to compile such information in the way of ties to existing monuments as would tend to place this office more in a position of being able to dispense with the very valuable assistance that we obtain as a matter of courtesy from other surveyors in the city. In conclusion, I cannot too strongly suggest that immediate action be taken to do away with the frequent encroachments on public highways that are already, in many instances, too narrow for the volume of traffic that they must carry.

AMERICAN SULPHURIC ACID INDUSTRY.

It is estimated that some 200,000 tons of sulphuric acid are used annually in the iron and steel and coke industry of the United States out of a total consumption of 3,250,000 tons. The iron and steel industry, indeed, uses such quantities that a tendency is developing for steel companies to erect and operate their own sulphuric acid plants. A coke plant consuming 2,000 tons of coal per day would produce from 14 to 30 tons of sulphate of ammonia daily, according to the nitrogen content of the coal used. Therefore, each 2,000 tons of coal, high in nitrogen, converted into coke daily, would call for a production of 10,000 tons of 50 deg. Be. sulphuric acid per year. By-product coke-ovens are now projected which will require 100,000 to 150,000 tons of 50 deg. Be. sulphuric acid per annum, in addition to the figure shown above.