and 135 ft. long has been ordered. The present cylinders have a capacity of 16 trains to a charge. The cylinder doors are swung from a crane attached to the cylinder, and when closed are secured by 24 clamps. These clamps are of heavier construction than that commonly used in creosoting plants in the United States. The cylinders are supported on I-beams carried on concrete foundations, with a special channel and I-beam construction at the expansion joints.

Two working tanks, 20 ft. in diameter and 14 ft. high, with a capacity of 34,500 gallons, supply oil to the cylinders through 8-in. pipes. A third working tank of the same size is practically completed and ready to operate. Compressed air is used to force the oil back when the pressure is removed. Recording thermometers and gauges are provided in the engine-room, which make a permanent record of the temperature and pressure in each cylinder during treatment, and a similar gauge registers the vacuum. Indicator gauges are also provided to show the amount of oil in the working tanks. The engine-room is equipped with three oil-pressure pumps, two vacuum pumps and two air compressors. The piping from the oil pumps is so arranged that either pump can force oil into either cylinder, thus eliminating the necessity for delay when either pump is

THE TREATMENT OF SEWAGE SLUDGE.

One of the largest schemes for the treatment of sewage, entailing an expenditure of \$6,000,000, is now being carried out by the corporation of Bradford, England. The original works at Frizinghall having proved to be inadequate, an estate at Esholt, covering an area of 1,856 acres, was purchased in 1906, situated to the northeast of the city, and about six miles distant from the centre of the town.

The plant for dealing with the sludge has been removed from the old works at Frizinghall and housed in new and commodious buildings at Esholt; and since it has been found necessary to retain for the time being the old precipitation tanks at Frizinghall for the collection of the sludge, a temporary 8-in. steel pipe-line has been laid down, some five miles long, to deliver sludge to the new works. The main which follows the towpath of the Bradford and Leeds and Liverpool Canals has been laid in such a manner that it has sometimes a falling gradient and sometimes a rising gradient, whilst a great length of it is level. The total fall from the inlet to the outlet end is 70 ft. In order to get sufficient velocity to discharge 500 tons of thick



out of order. Steam for the plant is supplied by two 450 horse-power Babcock and Wilcox boilers. Boiler water is secured from wells, and is treated by a soda and lime softening process. The boiler feed water is heated by a Cochrane heater. A 350-amp. 100-volt generator direct connected to a 50 horse-power engine furnishes electricity for 16 arc lamps and 350 incandescent lamps throughout the yard and the buildings.

A machine shop alongside the boiler plant is able to take care of minor repairs, and the locomotive house adjacent to the machine shop is used to store the yard locomotives. A bath-house is provided in the yard for the use of the 135 or more workmen which the plant employs. This house is equipped with two showers and four tubs. A boarding-house is furnished by the company near the yard for the accommodation of the workmen. The supply of creosote for the plant is kept in three storage tanks at present, one 40 ft. in diameter and 25 ft. high, and two 30 ft. in diameter and 15 ft. high. Two additional 30-ft. tanks 15 ft. high have been ordered and will be erected this year.

Mr. E. Bernard Smith, the general manager of the Dominion Tar and Chemical Company has recently removed his office, which is the head office of the company, from Sault St. Marie to the new Birks Building, Montreal.

The plant is operated under the direction of F. W. Zoates, manager for the Dominion Tar and Chemical Company, and G. G. Roberts, assistant manager. J. H. Dixon is the representative of the Canadian Pacific at the plant. sludge, containing only 80 per cent. of water, compressed air is fed into the main with the sludge, and this is the Pohle air lift worked upside down. It is found that the pressure on the inlet end varies from 30 lb. to 40 lb. per sq. in. The sludge is fed into the main by compressed-airoperated sludge-rams.

The new buildings, which cover 1¼ acres, are faced with a coarse sandstone. The design is in keeping with the nature of the stone, being massive and rugged in appearance, and the moulds simple, but bold.

In addition to the boiler-house, engine-house, and watertower there is a press-house measuring 237 ft. by 92 ft., which contains 128 sludge-presses-64 of which have been made by Messrs. Manlove, Alliott and Co., Limited, of Nottingham; 36 by Messrs. John Wilson and Sons (Johnstone), Limited, of Johnstone; and 28 are now being made by Messrs. Knowles and Co., of Bradford, to complete the installation of 128. The grease-house, measuring 237 ft. by 50 ft., contains 16 grease-vats, each capable of purifying 6 tons of grease, with a grease storage tank under, capable of holding 1,000 tons; also grease separators, sludge-boiling vats, and rams.

The sewage of Bradford presents unique features on account of its strength, character, and concentrated condition, for which the trade refuse discharged into the sewers is responsible, and on account of this peculiar character the sludge-disposal works present novel features, being designed for the recovery of grease from the sludge. The method