

depth, are collected in large storage tanks, or sometimes in earthen ponds or lakes, then are pumped into specially constructed tank-ships, ranging from 30,000 to 60,000 barrels in capacity, for transportation to the refineries of this country.

Both oils yield excellent paving materials; their high asphalt contents and correspondingly low percentages of light oils enable their refinement to be accomplished promptly and with a minimum risk of injuring the asphalt residues, which, in the handling of Mexican petroleum, are the major products of the refinery.

With both types of crude, furthermore, it is commercially practicable to stop the refining or reduction process at any stage of consistency between the fluidity of the natural liquid and the solidity of hardest paving cement, so as to give the engineer a material made by one simple process to the consistency he desires. By such procedure the natural fluxes are retained, and he is relieved of subsequent artificial fluxing with its attendant losses in time.

For paving cements and road binders there is apparently a preference for products of the heavier oils, doubtless on account of their greater density and lower paraffine content, but the lighter oils, however, serve as the chief source for road surfacing materials. When simply freed from moisture and sediment they serve as a cold surface dressing for macadam roads, the naturally occurring gasoline which they carry serving as a natural thinner to facilitate penetration into the road structure. Deprived of these lighter oils to greater or less extent, they serve in excellent manner for the more permanent and so-called hot surface applications.

A high asphalt content, with a corresponding reduction in the amount of burning oils, resulted in a complete change of purpose, and what was the "residuum," or residue, became the major product. This radical change in petroleum refinement has brought forth several new processes, among which may be mentioned those covered by the Dundas and the Trumbull patents. Both are of California origin, the former little used, but the latter in successful operation with both California and Mexican oils, and worthy of mention.

Its operation depends on pre-heating the oil, then pumping it to the top of heat-jacketed cylindrical towers, down the inner surface of which it is allowed to flow in a thin sheet of stream. Around a central vertical stand-pipe, or "off-take," are openings for the vapors or light oils to pass on their way to the condensers. These openings are protected by conical or umbrella-like shields so that they will not be clogged by the asphalt as it passes on its way to the bottom of the tower. The temperature employed and the rate of pumping determine the consistency of the asphalt.

The most generally used process, however, is that of steam distillation, which removes the lighter oils from the associated materials at temperature below their normal boiling points.

While these oils would require temperatures as high as 900° or 1,000° F. for their actual distillation, the steaming process enables them to be removed as low as 600° to 650° F., for in the best-regulated plants the asphalt in the still is never allowed to exceed such temperatures.

In the best-regulated plants recording pyrometers indicate the actual temperatures at all times, and when careful tests show that the desired consistency has been reached the charge is allowed to cool, then pumped to storage or drummed for shipment.

COAST TO COAST

Vancouver, B.C.—It is expected that work on the construction of the new grain elevator will be completed by the end of January.

Edmonton, Alta.—George Webster, contractor for the Grand Prairie branch of the Edmonton, Dunvegan and British Columbia Railway, states that the grading of the line is completed and ready for the steel.

Calgary, Alta.—All the plans, profiles and field work records of the proposed \$3,000,000 Elbow River water-works system are said to be missing from the city's vaults. These records cost about \$10,000. Various theories are advanced to account for their disappearance.

Quebec, Que.—The new branch line of the Quebec Central Railway, twenty-five miles in length, extending from St. Camille, Bellechasse County, to English Lake, was officially inspected last week by Hon. A. Taschereau, Provincial Minister of Public Works.

Hamilton, Ont.—The report of City Engineer A. F. Macallum, recently submitted to the city council, shows the following amount of local works completed during the year: 4.7 miles of sewers; 5.1 miles of cement walks; 2.6 miles of curbs; 7.3 miles of asphalt pavements.

Fort William, Ont.—According to the report of City Engineer R. R. Knight, \$24,198 was expended on streets and sewers in 1915, as against \$42,683 in 1914. Local improvement works which were initiated last spring cost the city \$39,754, and the laying of a feeder main to the west end of the city cost \$57,393.

Kingston, Ont.—City Engineer R. J. McClelland reports that he carried out the following work by day labor during 1915: 2¾ miles concrete walks; ⅓ mile sewers; ½ mile concrete curb; 6 blocks asphaltic macadam pavements; macadam roadway; resurfacing of macadam roadways with Tarvia.

Toronto, Ont.—At noon on December 24th, the dredging work in the Toronto Harbor closed for the season. Work was carried on for about two weeks later than it was in 1914. During the winter season the equipment will be overhauled and all preparations made for active work early in the spring.

Welland, Ont.—Major James Sheppard, superintendent of roads for Welland County, has submitted a report to the county council which shows that approximately 41 miles of new road were constructed last year—21.39 miles by the county and 19.67 miles by the contractors. The total mileage of improved road on the county system is now about 82 miles.

New Westminster, B.C.—M. H. MacLeod of Winnipeg, general manager of the Canadian Northern Railway Company's western lines, has announced that his company will commence work early this year on the construction of a line from the north end of the New Westminster bridge over a right-of-way which it has acquired through this city to a station to be built here.

West Kildonan, Man.—According to the report of Engineer Eatwell, local improvements costing \$330,529.36 have been completed during the past eighteen months, including Main Street paving, 1½ miles, \$58,796.31; Main Street concrete sidewalks, 1¼ miles, \$8,000; trunk sewer, 1 mile, \$113,646.57; lateral sewers, 6.1 miles, \$58,211.05; water mains, 7.15 miles, \$79,294.74; fire hall, \$7,200.

Montreal, Que.—According to a statement made by H. P. Borden, assistant to the chief engineer, work on