BITUMINOUS DEPOSITS IN NORTHERN ALBERTA.

At the recent annual meeting in Ottawa of the Commission of Conservation Dr. Eugene Haanel made some very interesting remarks in favor of the development of the bituminous sand region in the McMurray district of Northern Alberta, and stated that the non-existence of transportation facilities, upon which the utilization of the extensive deposits is dependent, will soon be overcome by the completion of the Alberta and Great Waterways Railway. This line, which will open up the region and render the deposits available, will be finished in 1916.

A preliminary examination of the deposits was undertaken by the Department of Mines, Ottawa, in 1913, and continued last year. The investigation revealed the fact that the tonnage of bituminous sands in the McMurray area is very large, and, although much of the material is low-grade and, in some cases, the overburden so heavy that mining by open-cut is impracticable, it is found that some 20 per cent. of the material representing many millions of tons, may be considered as of commercial value.

Bituminous sands have for a number of years been used in the construction of various classes of pavements. The extent to which the material has been used appears to have been largely determined by the freight rates. The greater portion of the bituminous sand used at the present time in California for paving purposes comes from the Santa Cruz quarries, and is, in many respects, similar to the Alberta material. The bitumen contained in the McMurray rock is, however, much softer. It is believed that, with proper manipulation, such as heating, and the addition of hardening flux, the penetration of the bitumen can be reduced to meet the requirements of standard specifications for its successful employment in the laying of pavements in substitution of imported asphalt.

In view of the fact that the bitumen contained in the tar sands of Alberta is softer than the bitumen of the California material, arrangements have been made by the Mines Branch for the laying of an experimental pavement in the city of Edmonton with the Alberta material, the city government having agreed to construct the concrete foundation. Upward of sixty tons of suitable material has been assembled for transportation to Edmonton, and it is expected that the pavement will be laid next summer.

The city commissioner states that: "If this work is successfully carried out it will be of greater value to the city of Edmonton and Alberta generally than the bringing in of half a dozen industries. . . . At the present time, we are absolutely suffering for the lack of cheap pavement and for the lack of good road material, whereby the farmers may haul their products to the city on well built roads. The solution of this problem will be worth millions of dollars. . . ."

At present, all asphaltic paving materials used in Canada are imported from foreign countries. In 1913-14 the value of these imports reached a total of nearly $900,000, and the consumption is rapidly increasing. The value of a cheap and satisfactory paving material in Western Canada would be very great.

The bituminous sands may also serve as a source of pure bitumen, which may be extracted either by disulphide of carbon, the lighter petroleum distillates, or by the use of hot water and steam. Among the many uses to which this extracted bitumen may be applied may be mentioned: floorings for many classes of buildings—such as mills, hospitals, schools, skating rinks—for foundations which require to absorb vibration and jars, as in electric power plants, for lining and damp courses for cellars, reservoirs, etc., for insulation of pipes, and as a source of asphaltic oils.

Attempts in this direction have been made for the past twenty years in the United States. No industry, however, has been established and no extracting plant is now in operation. The cause for the failures is not far to seek. In California extracted bitumen, at $12 per ton, cannot compete with petroleum residuum at $6.50 to $9 per ton. In Alberta, however, bitumen extracted at $12 would compete with imported refined asphalt, costing $27 to $34 per ton, delivered.

Before such an industry is attempted, however, all available information of the results of many years' serious and often costly experimentation in the United States should be consulted.

THE SECOND NARROWS BRIDGE AWARD.

The Canadian Engineer for August 20th, 1914, contained some interesting details respecting the Second Narrows Bridge controversy arising out of the conclusion on the part of the Burrard Inlet Tunnel and Bridge Company, that the first design, prepared by Sir John Wolfe-Barry, Lyster & Company, England, (a $2,500,000 proposition) was too expensive. A summary was given of three subsequent tenders for a cheaper structure, as advised by the provincial government. These tenders were those of the Dominion Bridge Company, associated with Armstrong-Morrison & Company, Vancouver; C. A. P. Turner, Minneapolis, Minn., associated with the Western Foundation Company, Vancouver; and the Canadian Bridge Company, Walkerville, Ontario. These tenders amounted to $1,916,000, $1,744,831, and $1,846,000, respectively. The Burrard Inlet Tunnel and Bridge Company did not succeed in coming to a definite conclusion when the tenders were opened. The British Columbia Manufacturers' Association, the Board of Trade and other public and influential organizations took a great interest in the proposed designs. The provincial government, although anxious that the structure be proceeded with, did not undertake the responsibility of making a recommendation. Thereupon the company called in the services of Mr. Ralph Modjeski, of Chicago, to report upon the three designs.

After a lapse of four months, Mr. Modjeski made an extensive report in which he called attention to the fact that all three designs were lacking in sufficient detail and were inconsistent in many respects. He placed them in the following order of merit, however: Canadian Bridge Company, Dominion Bridge Company, and C. A. P. Turner. He suggested that none be accepted as they stood, but that the tenderers be allowed an opportunity of revising their plans and estimates to better meet the local conditions, or better, the Board prepare a new and complete set of plans and invite new tenders thereon. In case the latter was adopted, the report suggested a more substantial substructure with pneumatic foundations; a deeper draw-span designed as a continuous structure; a long fixed span similar to the design furnished by Mr. Turner, on condition that a change in the Crown grant for portions of the bed of the Narrows might be secured; and an approach viaduct of girders supported on reinforced concrete base. Mr. Modjeski submitted an arrangement of electric railway tracks and roadway for the main bridge, that differed considerably from that in the plans of the three tenderers.