

John McAulay

This giant bucketwheel, part of one of the 1,700-ton machines used to mine the Athabaskan oil sands, is capable

of scooping up over 50,000 tons of oil sand a day.

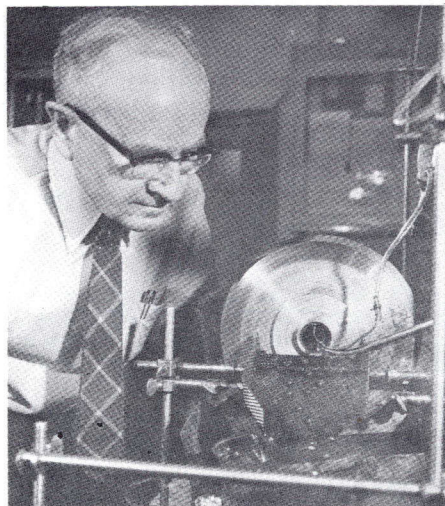
loving) materials remain in suspension. A carefully controlled volume of water is then sprayed into the rotating system, which preferentially wets the surfaces of these hydrophilic solids. On collision during agitation, these wetted surfaces adhere because of the surface tension that exists between the kerosene and water, thus building up dense, spherical particle clusters.

"It is the interfacial surface tension between these two immiscible liquids (kerosene and water) that acts as the bonding force holding the agglomerates together," explains Dr. Puddington.

Old method

The extraction method now in use, which involves "scrubbing" the tar sand with hot water and steam, has a serious disadvantage not shared by spherical agglomeration. This is in the need for huge "tailing" ponds to contain the effluent produced by the process. The waters of these man-made lakes (one of them measures nine square miles in area and reaches a depth of 300 feet) are murky with suspended clay and other fine mineral matter that do not readily settle out. As such, they cannot be discharged into the rivers of the area, and the volume of tailing water continues to increase. (These same contaminants are locked in the hard spheres of the spherical agglomeration process.)

It has been suggested that the two processes may in fact serve as valuable complements of one another. The



The spheres that Dr. Ira Puddington observes leaving the rotating drum contain sand and other hydrophilic substances from a sample of Alberta tar sand. The valuable bitumen is left behind in a light hydrocarbon solvent within the drum.

tailing water may be too dirty for recycling in the hot water process, but its clay content makes it ideal for use as the bonding agent in spherical agglomeration. Thus, the NRC process would help eliminate, at least in part, the most serious drawback to hot water extraction. In turn, the large amounts of kerosene or other light hydrocarbon required by spherical agglomeration could be provided by the hot water process during the initial production stage.

At present, Terra Energy of Calgary Limited holds a licence from NRC's

Canadian Patents and Development Limited (CPDL) to exploit the agglomeration process as it applies to tar-sand extraction. In the development research required to scale the laboratory process up to the much larger dimensions of a pilot plant, the Council has also provided financial assistance under its new Pilot Industry/Laboratory Program.

Should this novel process live up to its initial promise in tar-sand extraction, as many scientists believe it will, then NRC will have contributed significantly to one of the most important developments in energy-resource extraction of the century. (From *Science Dimension*, 1976/1, a publication of the National Research Council of Canada.)

CN Railway team in East Africa

A team of eight employees of Canadian National is in Nairobi, Kenya, to study and recommend plans for the decentralization of the 3,680-mile East African railway system.

The team will spend eight months in the East African community, which is made up of Kenya, Tanzania and Uganda.

The East African Railway Corporation's (EARC) railway serves the three independent nations and links inland areas with the Indian Ocean ports of Mombasa, Dar-es-Salaam and Tanga. In addition, the corporation operates road, marine and hotel services.

The CN has had previous experience in Africa through work with the railways in Zambia, Guinea, Nigeria and in East Africa.

W.R. Corner, CN's vice-president of accounting, heads the team of Canadian officials. The aim of the in-depth study is to increase the efficiency of the East African railway system so that it can meet effectively the economic needs of the three partner states of the community. All aspects of the administrative and operating elements of the EARC will be reviewed and recommendations made to assure its sound financial administration within the three sovereign states of East Africa.

A tripartite agreement was signed recently. The project is funded by a World Bank loan.