

Because of the increasing industrial aspects of the project and the growing view that large-scale industrial application of atomic energy was closer at hand than had been expected, the Government decided that the project should be operated by a separate organization without further responsibilities. Therefore, a new Crown company, Atomic Energy of Canada Limited, was incorporated in February 1952, under the Atomic Energy Control Act, 1946, to take over from the National Research Council, on Apr. 1, 1952, the operation of the project.* In 1953 the project employed a total of 1,700 people, of whom some 550 were scientific and technical personnel. The residential area for the project, Deep River, which is seven miles up the Ottawa River from the project, had a population of about 2,600 by the end of that year.

The Commercial Products Division of the new Company, which handles the marketing of isotopes, was transferred from Eldorado Mining and Refining Limited on Aug. 1, 1952. This Division, which has its headquarters at Ottawa, offers for sale the following products: isotopes which are produced in bulk at Chalk River and processed as required by the Division before shipment; equipment and instruments which are manufactured by the Division at Ottawa; and radium which is obtained in bulk from Eldorado Mining and Refining Limited and processed into various forms suitable for use in industry, research and therapy. Radioactive isotopes for use in the human body, such as iodine-131, phosphorus-32 and gold-198, are supplied by the Division to Charles E. Frosst and Company, Montreal, for distribution. More than a thousand shipments of isotopes were made during 1952. Six Cobalt-60 Beam Therapy Units were produced and are now installed in hospitals at London, Ont., Winnipeg, Vancouver, New York, Minneapolis and Chicago.

In December 1952, the NRX reactor broke down but restoration began immediately. So far as is known, this was the first time a large nuclear reactor had been completely dismantled after several years of operation and information of a particularly valuable nature was obtained. By the end of 1953, considerable progress had been made in the construction of a third and even more powerful natural uranium-heavy water reactor known as NRU.

Considerable progress was achieved during 1952-53 in the acquisition of new basic knowledge of nuclear science in its many phases, as well as in the chemical separation operations and isotope production processes. The ZEEP was used for essential investigations in connection with design of fuel rods and lattice arrangements required for the new NRU reactor. The NRX reactor was in continuous operation at high-power level 90 p.c. of the 24-hour-per-day period from the beginning of April 1952 until the breakdown occurred on Dec. 12 which caused its shut-down. Many fundamental investigations were performed during this period on nuclear reactions using the high flux which this reactor provided.

The Van de Graaff accelerator was operating on two shifts at potentials as high as 3,000,000 volts, providing a strong beam of protons of uniform and predetermined energy. These energetic particles have been employed to determine resonance levels in disintegrating nuclei and the angular distribution of the products of such reactions have been measured. The angular scattering of protons of given velocities by nuclei has also been investigated. Nuclear investigations on delay times of the order of a thousand millionth of a second between the emission of a β and subsequent γ ray from a disintegrating nucleus have continued, using special β ray spectrometers and coincident timing circuits. During the period of NRX operation,

* The President of the Company was Dr. C. J. Mackenzie, C.M.G., succeeded on Oct. 31, 1953 by W. J. Bennett, O.B.E., President of Eldorado Mining and Refining, Limited.