well as with Australia, Japan, Pakistan, Sweden, Switzerland, West Germany, India, U.S.S.R. and, less formally, with Denmark, France and Norway. In India, a major experimental reactor—the Canada-India Reactor—similar to NRX at Chalk River was constructed and was formally inaugurated in January 1961.

A 200-megawatt plant similar to that at Douglas Point is also being constructed in India on a co-operative basis, known as the Rajasthan Atomic Power Project (RAPP).

Chalk River Nuclear Laboratories.—At this research and development establishment, basic and applied research is carried on by about 200 professional scientists and engineers supported by 300 technicians devoted to research in nuclear physics, nuclear chemistry, radiobiology, reactor physics, radiation chemistry, environmental radioactivity, physics of solids and liquids, and other subjects, using as their primary facilities the two major reactors, NRX and NRU, the auxiliary reactors, ZEEP, PTR and ZED-2, the tandem Van de Graaff accelerator and analytical facilities such as a precision beta-ray spectrometer, mass spectrometers, electron microscopes, multi-channel pulse analysers, automatic recorders, and analogue and digital electronic computers.

Basic research is carried on in many fields, especially that of the structure of atomic nuclei, and of the interactions of neutrons, not only with individual nuclei but also with liquids and crystalline solids, particularly those involving energy transfer. For nuclear structure studies, the tandem Van de Graaff has made pioneer work possible by providing multiply charged ions of precisely known energy and direction. It has proved possible to produce nuclei in specific energy states by different routes and to identify and analyse the states, thereby deducing the spin and other characteristics and discovering, for example, a correlated series of rotational states in the nucleus neon-20. Not only is this important to a basic understanding of nuclear structure, but it also finds application in unravelling the complex of nuclear reactions responsible for the genesis of nuclei in the interior of stars.

Studies of neutron interactions with matter are made possible by the intense beams of neutrons available from the NRU reactor. By monitoring the neutrons in cosmic radiation, it has been possible to find correlations with the occurrence of solar flares and contribute to the recent advances of knowledge of phenomena in interplanetary space. Isotope techniques have brought about revisions in the basic theory of chemical reactions induced by radiation. This basic research may find a useful application in the technology of using an organic liquid as coolant in nuclear power reactors.

Since extracted plutonium is no longer required, the fuel in the NRX reactor has been changed from natural uranium metal to a combination of natural uranium oxide and a uranium-235 aluminum alloy. The available neutron flux has been increased thereby, while keeping the heat production at 42 megawatts. At the end of 1963, the fuelling of NRU was revised similarly. In this case the thermal neutron flux has been kept constant while the heat production has been reduced from 200 to 60 megawatts.

The research facilities of the NRX and NRU reactors have continued to attract individual scientists as well as teams from other countries. A team of scientists from Harwell (Br.) and other countries is using a system of choppers for studying details of the slowing-down of neutrons by moderators. Both in NRX and NRU the exceptional facilities for irradiations in high temperature water, steam and organic liquids have brought teams from Britain and the United States and individuals from West Germany and Sweden to conduct tests important for the design of future power reactors.

Nuclear Power Prospect.—The generation of electricity by nuclear power on a competitive economic basis is expected to be established by the type of reactor now under construction by the Power Projects Division of AECL. This promise rests on the attainment of very-low-cost fuelling by an extremely simple system that has proved satisfactory in the Nuclear Power Demonstration Station reactor where there has been no fuel failure in the first two years of operation. The fuel is uranium dioxide specially prepared from