

release of the tremendous energy stored within the atom. On the squash court underneath the west stands of Stagg Field on the University of Chicago campus, American scientists, working under the direction of Enrico Fermi, piled up layers of graphite and uranium (hence the term "pile") until the power indicators showed that a chain reaction had been initiated.

In 1942 the Government of the United Kingdom, where significant experiments had been made, suggested to the Government of Canada that a joint Canadian-United Kingdom atomic energy project should be set up in Canada. This was agreed to and by January 1943 British scientists arrived to work with hastily recruited Canadian scientists in a research centre established in a house on Simpson Street, Montreal. In February the group moved to the newly completed University of Montreal to work in great secrecy on the design of a heavy-water pile. Although considerable progress was made in this laboratory on the investigation of fundamental nuclear processes, the staff was hampered by a feeling in the United States, where atomic research was well advanced, that close co-operation with the scientists at Montreal would involve security risks through the wider distribution of classified United States research results.

At the Quebec Conference in August 1943, President Roosevelt, Prime Minister Churchill and Prime Minister Mackenzie King agreed that closer co-ordination of the allied efforts in the nuclear field was desirable and among other things it was agreed that a large heavy-water pile should be built immediately in Canada. A technical committee consisting of General Groves, Sir James Chadwick and Dr. C. J. Mackenzie was set up to co-ordinate this joint program on atomic energy. Dr. J. D. Cockcroft of the United Kingdom was appointed Director, Defence Industries Limited was engaged to undertake the detailed design and construction, a site on the Ottawa River about 130 miles west of Ottawa was chosen and construction started in 1944. By September 1945, a small low-power atomic energy pile, known as ZEEP, was in operation at Chalk River. This was the first pile outside of the United States to produce energy by nuclear fission.

In December 1946, by Act of Parliament, all matters concerning atomic energy in Canada were placed under the Atomic Energy Control Board. The Board immediately asked the National Research Council to assume responsibility for the operation of the complete establishment at Chalk River and, on Feb. 1, 1947, the Council formally took over that responsibility. By then, 400 scientists and engineers were engaged on research and development of atomic energy, the largest organization ever created in Canada to carry out a single research project.

In 1947, Dr. David A. Keys took on direction of the Chalk River project, with the research program being under the direction of Dr. W. B. Lewis. Dr. Cockcroft returned to England to take charge of the United Kingdom atomic energy project which was founded in 1946.

In July 1947, Canada's second reactor (the term reactor has replaced "pile" in atomic energy parlance) went into operation. It was outstanding because it had the highest neutron flux of any known reactor and, like ZEEP, used natural uranium as a fuel and heavy water as a moderator. With this reactor it was possible to produce radioactive isotopes with a high specific activity for which there was great demand. Purchasers of Canadian isotopes include the United States, the United Kingdom and various countries in western Europe and South America. Shipments have been made within Canada to industries, hospitals and universities.