



Herbert M. Parker

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1910–1984

By Merrill Eisenbud

Herbert M. Parker, who played an important role in organizing the radiological safety programs in the United States during and after World War II and who achieved worldwide recognition for his contribution to the excellent safety record of the nuclear industry, died at the age of seventy-three on March 5, 1984.

Mr. Parker was born in Accrington, England, on April 13, 1910. He received an M.S. in physics from the University of Manchester in 1931 and began his career as a medical physicist at the Christie Hospital and Holt Radium Institute in Manchester. While there, he shared in the development of the Paterson-Parker method of determining the size of the radiation dose to cancerous tissue from radium therapy. This method was a major development in radiotherapy, which is still used more than half a century after it was first published.

In 1938 Parker was invited to join the staff of the Swedish Hospital in Seattle, where he was placed in charge of radiological physics at the Tumor Institute. He became associated with Simeon T. Cantril, a radiologist at the institute who, together with Parker, was to play a prominent role in the war-time atomic energy program. In 1942 Parker joined the University of Chicago's "Metallurgical Laboratories," the assembly site for the nucleus of the Manhattan Project. In 1943 he moved to Oak Ridge, where he established the radiological

safety program for the first of the major U.S. atomic energy research and production centers.

This program was no small undertaking. Before World War II, U.S. researchers' experience with radioactive substances was extremely limited. Only slightly more than one kilogram of radium had been extracted from the earth's crust, but the processing and use of that small amount of radium, mainly in luminizing compounds, had already caused the deaths of more than one hundred persons. Additional injuries and deaths had been caused by overexposure to the X-rays used in medical practice. With this limited base of experience, Parker and his small group of associates faced the prospect that the material to be processed by the Manhattan Project would be the radioactive equivalent of hundreds of tons of radium!

Fortunately, information from earlier misadventures with radium and X-rays provided a starting point for dealing with the new problems that had to be faced. The use of this meager information to design procedures that safeguarded atomic energy workers and the public from the effects of ionizing radiation was one of the truly remarkable and unheralded technological achievements of the Manhattan Project. New instrumentation had to be developed, people trained, and procedures instituted that would protect human lives and also permit the expeditious achievement of the program's goals.

Herbert Parker played a key role in establishing the basic philosophy of radiation protection and in developing the information and skills that were needed to implement it. He was a leader in introducing units and quantities into radiation protection that are relevant to the absorption of energy in tissue. He invented the rep (forerunner of the rad, the term in current use) as a practical energy absorption dose unit. He modified the rep by factors that accounted for differences in biological effects to produce the rem, a unit that allowed doses from different kinds of radiations to be summed. The rem, which can be considered a unit of risk, is still in use.

After he established the basic radiation protection program at Oak Ridge, Parker was transferred in 1944 to a new industrial complex at Hanford. Here, E. I. du Pont de Nemours and Company, Inc., had been charged with the design, construction, and operation of facilities to produce and separate plutonium. To process and separate plutonium in large quantities from highly radioactive reactor fuel, as well as to machine and fabricate plutonium metal, it would be necessary to operate the world's first large nuclear reactors. Parker was sent to Hanford to organize and direct the facility's program of radiological protection.

At Hanford, Herbert Parker not only organized a model radiological protection program, but he also initiated research to develop new instrumentation and to obtain information on the dispersion of radioactive materials in the environment—information that was required for improved radiation protection. He participated in classic investigations of diffusion in the atmosphere, soils, and water (e.g., the Columbia River).

Herbert Parker actively supported early studies of the environmental and biomedical aspects of radioactive particles containing fission products and plutonium. He was also among the first scientists to undertake quantitative assessments of the effects of reactor accidents, presenting a landmark paper on the subject at the first United Nations Conference on the Peaceful Uses of Atomic Energy in 1955.

In 1947, when the operation of Hanford was transferred from Du Pont to General Electric, Parker became manager of operational and research activities in radiological sciences. Appointed manager of Hanford Laboratories when it was formed in 1956, he led the development efforts that produced a research facility capable of addressing the complex technical, engineering, and scientific problems of the nuclear energy field. He held this position until 1965, when responsibility for the operation of the labs was transferred from General Electric to Battelle Memorial Institute and the facility was renamed the Pacific Northwest Laboratory.

Mr. Parker remained with Battelle until his death, serving

at various times as consultant to the director and as an associate director. He was also a distinguished consultant to many other organizations, including the American College of Pathology and the Advisory Committee on Reactor Safeguards of the U.S. Nuclear Regulatory Commission.

Herbert Parker was widely respected by his peers with whom he joined in the work of a number of professional groups. He was elected to the National Academy of Engineering in 1978. He was a member of the National Council on Radiation Protection and Measurements, and he served as chairman of its Scientific Committee on Basic Radiation Protection Criteria. He was also a member of the American Nuclear Society, where he served on the board of directors. He was a fellow of the American Physical Society and of the British Institute of Physics, and he served on numerous scientific and technical committees, freely contributing his ideas and knowledge.

Parker was certified as a health physicist by the American Board of Health Physics and as a radiological physicist by the American Board of Radiology. He received the Distinguished Achievement Award of the Health Physics Society and the Janeway Medal of the American Radium Society.

Herbert Parker had many fine personal qualities in addition to his intellectual capabilities. He was a handsome man of commanding appearance, and he had an extraordinary ability to surround himself with talented people. He was noted for his dry British humor and outstanding speaking ability. Herbert and his wife Margaret lived comfortably on the banks of the Columbia River, where they propagated prize irises, of which he was very proud. He is survived by his wife and four children, Henry, John, Elizabeth, and Linda.

His many colleagues throughout the world are grateful for his accomplishments and for the privilege of having been his associates and friends. The extraordinary safety record of the atomic energy industry in the United States and elsewhere is the result, to a large degree, of the fundamental pioneering work of Herbert Parker.

