

*At a meeting of the FACULTY OF ARTS AND SCIENCES on November 5, 2019,
the following tribute to the life and service of the late Richard Wilson
was spread upon the permanent records of the Faculty.*

RICHARD WILSON

BORN: April 29, 1926

DIED: May 19, 2018

Richard Wilson had two passions, each of which he pursued with exemplary achievements: nuclear and elementary particle physics and educating governmental bodies and the public on a wide range of scientific issues. Throughout his adult life he was filled with focused energy.

Wilson earned a D.Phil. degree from Oxford in 1949 and did postdoctoral research at Rochester, Stanford, and Oxford before coming to Harvard in 1955 as an assistant professor. He immediately joined the effort to increase the energy of the Harvard Cyclotron, which he used for several years to study nucleon-nucleon scattering. As the usefulness of the cyclotron as a particle accelerator decreased in the late 1960s, Wilson championed its continued use for nuclear medicine. When the cyclotron finally shut down in 2002, it had treated more than 9,000 patients. Wilson noted that his contribution to nuclear medicine may have been the most important achievement of his life.

Wilson said that his lifelong obsession was the structure of nucleons. He realized that the best way to study it was through scattering of electrons from nucleons. A major attraction of coming to Harvard was the plan to build the Cambridge Electron Accelerator (CEA), a 6-GeV electron synchrotron, which would allow this study. Wilson was able to do these experiments at the CEA in the early 1960s, followed by studies of muon-nucleon scattering at Fermilab in the 1970s and 80s, and the studies of polarized electron-nucleon scattering at the Thomas Jefferson National Accelerator Facility in the 1990s and the following two decades.

As early as 1961, realizing the great physics potential of colliding electrons with positrons, Wilson proposed turning the CEA into such a device. These proposals were rejected for many years, but Wilson and his coworkers were able to collide electrons and positrons in a bypass section of the CEA in 1972. The 1973 results exhibited anomalies that correctly foreshadowed the Nobel Prize-winning discoveries at Stanford a few years later. In the following three decades, Wilson pursued the study of the properties of the most massive mesons, those

containing the bottom quark, at the electron-positron colliding beam facility at Cornell University.

In 1965, a devastating fire broke out in the CEA when a beryllium window in the MIT bubble chamber broke and allowed liquid hydrogen to escape. Although Wilson had no control over the bubble chamber engineering and safety, as chair of the CEA management committee, he felt a heavy sense of responsibility and guilt, which he said probably influenced his doing later work in risk analysis and disaster prevention.

In 1971, Wilson was invited by the head of the Atomic Energy Commission to educate the public on nuclear power issues. The following year, he wrote an influential article which laid out a quantitative evaluation of the health risks of low-level radiation compared to air pollution and he began testifying at nuclear power plant hearings. The state of Maine hired him as a consultant to evaluate the request of the Maine Yankee power plant for an operating license.

Wilson advocated the adoption of probabilistic risk analysis in evaluating the risks in any industry. He pointed out that had the Three Mile Island reactor used this method, they could not have failed to find the problems that made the accident there possible. However, it was another twenty years before the Nuclear Regulatory Commission required it.

Wilson's interest in chemical carcinogens began in 1974 when he was approached by a chemical company concerned about inhalation of vinyl chloride fumes by its employees. Influenced by Wilson's report, the company reduced the limit on exposure to these fumes a thousandfold.

This experience led Wilson and his students and postdocs to investigate issues such as the relationship between animal studies and human effects and between acute toxicity and carcinogenic potency. One interesting result was that the incidence of human cancer falls after age 80, going effectively to zero at age 100.

One exception to the general correlation of animal and human response to carcinogens is arsenic. Mice and rats fed arsenic do not develop cancer. However, in 1990, Wilson discovered data that showed a high rate of cancer in a region of Taiwan where there was arsenic in the drinking water. Searching for data from other areas that had arsenic in the ground water, Wilson found the same thing in regions in Chile and Mongolia. He then learned that there was a worse problem in some villages in Bangladesh. Visiting there in 1998, he discovered 120 cases of skin lesions in a village of 900 residents. On returning to the United States, he found that no government agency was interested in providing pure water for these villages. As a result, Wilson founded a non-profit foundation and began soliciting donations.

In 1987, joking that he was their “token liberal,” Wilson began working with the Atlantic Legal Foundation to exclude “junk science” from the courtroom. He wrote several amicus briefs on the admissibility of expert testimony. In the landmark Supreme Court Daubert case, his brief was the first one quoted in the decision.

Wilson won several awards for his public service, including two from the American Physical Society, the 1990 Forum Award for outstanding contributions to the public understanding of issues involving the interface of physics and society, and the 2012 Andrei Sakharov Prize for “tireless efforts in defense of human rights and freedom of expression and education.” In 2007, the American Society of Mechanical Engineers awarded him its annual Dixie Lee Ray award for environmental protection. The citation read, “For significant contributions to the scientific and engineering foundation of environmental protection, particularly methodology of risk assessment, risk assessment of specific pollutants, cancer assessment, risk assessment of nuclear power including nuclear waste, and ethics in environmental science and engineering.”

Wilson died on May 19, 2018, at the age of 92. Until near the end, he could be seen daily in the halls of Jefferson Laboratory. His wife of 64 years, Andrée, preceded him in death. He is survived by six children.

Respectfully submitted,

Gerald Holton
Irwin Shapiro
Gary Feldman, Chair