At a meeting of the FACULTY OF ARTS AND SCIENCES on February 10, 1998, 
the following tribute to the life and service of the late Kenneth Tompkins 
Bainbridge was spread upon the permanent records of the Faculty.

KENNETH TOMPKINS BAINBRIDGE

BORN: July 27, 1904
DIED: July 14, 1996

Kenneth Tompkins Bainbridge, the George Vasmer Leverett Professor of Physics, 
Emeritus, died at his retirement home in Lexington, MA, July 14, 1996, just thirteen days 
before his 92nd birthday. Kenneth Bainbridge grew up in New York City where, as a 
teenager, he had started to experiment with radio transmission as a "radio amateur" with 
call letters 2AW, from his home on Riverside Drive.

In 1921 he gave up radio to enroll in a five-year combined S.B. and S.M. program in 
electrical engineering at the Massachusetts Institute of Technology. It was a cooperative 
arrangement with the General Electric Company, leading him to spend his summers in the 
GE Research Laboratories at Schenectady. Continuation as an employee of the General 
Electric Company after graduation would have been a natural consequence of the program. 
His experience there led to his obtaining patents on cesium-oxygen-silver photoelectric 
cathodes and electrodes for secondary emission which contributed to the development of 
television. He had, however, become especially interested in physics and entered the Physics 
Department at Princeton, influenced in part by Karl Compton, its Chairman and a 
consultant to GE.

At Princeton he became interested in nuclear physics which he pursued largely through 
reading the limited literature then available. He designed his first mass spectrograph to 
search for element 87, eka-cesium, which he thought might occur in ores rich in the alkaline 
metals. Ken then spent four years at the Bartol Research Foundation where he continued to 
measure isotopic masses and to compare mass differences with the energies measured in 
nuclear decays, checking the validity of the energy-mass equivalence of Einstein, E=Mc2.
He had become widely recognized for his development of one of the most advanced mass 
spectrographs of that era

Bainbridge spent 1933-1934 at Ernest Rutherford’s Cavendish Laboratory, then a leading 
center for nuclear physics, as a Guggenheim Fellow, and began a lifelong friendship with 
(later Sir John) J. D. Cockcroft. In 1934 Ken joined the Harvard Physics Department,
rejoining his former colleague from the Bartol, J. Curry Street. He continued his pursuit of nuclear mass spectroscopy, but with Street's collaboration in 1936 he also undertook to build a cyclotron. Ernest O. Lawrence of Berkeley aided this project by sending detailed drawings of his newest cyclotron (the "37 inch"). Ken's first graduate student, Edward M. Purcell, also participated in the cyclotron project. The instrument became operational well before the widespread disbandment of physics research for World War II. In 1943 the cyclotron was requisitioned by the Manhattan Project of the U.S. Army, dismantled and shipped to Los Alamos, never to return.

Prior to 1940 Bainbridge had proposed a method of isotope separation using counter flow in a Holweck pump. He brought the Harvard chemists E. Bright Wilson and George B. Kistiakowski into the project. When they brought their work to the attention of the Navy in Washington, they were told that classified work was under way and the situation was well in hand.

In September 1940 Bainbridge was the first physicist to be recruited to the microwave "radio location" project that became the Radiation Laboratory at MIT. Ken's experience at the Cavendish was an asset in this activity which had begun in close collaboration with British scientists. He oversaw the development of radars of increasing power especially for the Navy. In the spring of 1941 he made a visit to Britain under wartime conditions to observe and report on secret developments there, and learned about British studies for nuclear energy in addition to radar. In May 1943, Ken was recruited to the nuclear weapons laboratory at Los Alamos. There he prepared and directed a facility for the first explosion of a nuclear bomb, the "Trinity Test." Following the fearsomely successful explosion early in the morning of July 16, 1945, he congratulated J. Robert Oppenheimer and the others, then made his legendary remark, "Now we are all sons of bitches." Oppenheimer later remarked that this was the best thing anyone had said just after the test. Ken subsequently was deeply dedicated to the control of nuclear weapons.

Returning to Harvard in 1945, Bainbridge laid the plans to replace the cyclotron with a 96-inch synchro-cyclotron and also constructed a large mass spectrograph designed for precision mass measurements. Funding was aided by the new ONR and AEC. The cyclotron project, was taken over briefly by Robert R. Wilson, who was succeeded by Norman F. Ramsey. That cyclotron still operates, and has provided physicians from MGH with a facility for clinical use and research in proton beam therapy for some forty years.

With his return to academic life, Bainbridge devoted much time to developing an advanced teaching laboratory in nuclear physics. Many of the graduate students that arrived after the war were introduced to experimental nuclear physics in Ken's meticulously developed laboratory. In his research Ken developed techniques to measure the very small changes in the lifetimes of nuclear-electron capture transitions with differing atomic states and with hydrostatic compression. In all his work Kenneth Bainbridge was extraordinarily thorough.
and was meticulous in his keeping of records, habits that enormously aided his successors in those projects. Ken took pains to see that credit and recognition was properly given to his colleagues and friends for their accomplishments. Ken suffered a tragic loss in 1967 when the former Margaret Pitkin, his wife of thirty-six years and mother of their three children, Martin, Joan, and Margaret, died unexpectedly. They had very recently completed their long planned new summer house overlooking Chilmark Pond on Martha's Vineyard. Two years later he married Helen Brinkley who also predeceased him. In the early nineteen-fifties Ken served as Chairman of the Physics Department. The Morris Loeb Lectureships are one legacy of Ken's stewardship. When a colleague came under attack by a committee of the Congress and Senator McCarthy, Ken gave generously of his time and energy in defense. This Faculty, the Department of Physics, and the country have lost a distinguished and dedicated colleague in the passing of Kenneth Bainbridge.

Respectfully submitted,

Robert Pound
Richard Wilson
Norman Ramsey, Chair