



MORSE

filled for many years, interrupted only by a hiatus during World War II. He gave advanced instruction to the brighter undergraduate students. One such undergraduate was Richard Feynman and the subject was quantum mechanics. At this time he renewed his interest in acoustics. A consequence was his book *Vibration and Sound* (1936), which he revised and expanded with Uno Ingard in 1968. Of equal importance to his book was his impact on the field: He brought up to date the methods employed by Lord Rayleigh and applied the results to practical problems of, for example, architectural acoustics.

During World War II Morse became interested in operations research. He and his colleagues played a decisive role in the defeat of the German submarine campaign. He gave a fascinating account of that effort in his autobiography, *In At The Beginnings: A Physicist's Life*. Operations research was to remain an abiding interest. After World War II he wrote several texts in the field, organized the Operations Research Society and helped set up similar efforts throughout the world. Industry, service functions and libraries represent a few areas of application of this methodology that he initiated and developed.

Also after World War II, he became the first director of Brookhaven National Laboratory, creating an outstanding institution of a new kind—the first in which a number of universities joined together to provide the research community with larger facilities, such as reactors and accelerators. Returning to MIT, Morse and I completed *Methods of Theoretical Physics* (1953); he became chairman of the Faculty, Chairman of the Committee on Computation and, later, director of the MIT Computation Center. He initiated an expansion of MIT's program in computers with IBM's gift not only of a

computer, but also of funding for fellowships. Morse was the driving force behind the useful *Handbook of Mathematical Functions*, edited by Milton Abramovitz and Irene Stegun and produced by NBS in 1964. It was in this period also that he founded a new journal, *Annals of Physics*.

Going further afield, Morse was a member of the Committee on Unified Science and Mathematics for Elementary Schools of the MIT Educational Development Center, which was concerned with the teaching of mathematics in elementary schools. He originated a decision-oriented method of instruction that has been adopted by many schools nationwide. More recently his interests in the problems of the Navaho nation led the National Academy of Sciences to establish the Committee on Technical Assistance to the Navaho Nation, which he headed from 1980 until his death.

His peers recognized his contributions by electing him to the presidencies of The American Physical Society (1972), of the Operations Research Society (1982) and of the Acoustical Society of America (1980). He was the first chairman of the APS Panel on Public Affairs and he headed the governing board of the American Institute of Physics (1975–80).

Morse's was truly a distinguished career, characterized by a unique breadth and fostered by his wide range of interests and his ability to initiate and develop new ventures. He was a dedicated scientist, or better, natural philosopher. As he wrote: "For those of us who like exploration, immersion in scientific research is not dehumanizing; in fact it is a lot of fun. And in the end, if one is willing to grasp the opportunities it can enable one to contribute something to human welfare."

HERMAN FESHBACH
Massachusetts Institute of Technology
Cambridge, Massachusetts

Peter Braun

Peter Braun, physicist at Technische Universität Wien, died on 19 October 1984. He was 46 years old.

Braun was born in Vienna in 1937. He worked for several years at the Reichert optical company and at Bundesversuchsanstalt arsenal in Vienna before enrolling at Technische Universität Wien. He completed his doctoral thesis on light scattering in liquids near the critical point while helping to organize a new institute at the university.

When he began his studies in surface science in 1970, Auger electron spectroscopy was a rather new technique. After two Fulbright fellowships with G. K. Wehner at Minnesota, Braun established this analytical technique in Austria, and a great part of the further success of surface science in his home country is clearly to be attributed to him. He soon extended the potential of Auger spectroscopy to alloys, studying surface compositions and their changes due to electron and ion impact. At the same time, he taught for many years at Technical Institute in Mödling, where he had gained his own technical interests years before.

Braun was a dependable colleague in scientific as well as in administrative tasks. He had a talent for grasping new ideas, and he always found elegant and simple solutions to the problems he faced. From 1979 to 1981 he was *Aktuar* of the Austrian Vacuum Society. He was a member of the editorial management board of the journal *Vacuum TAIP*, and he served as a referee for several other scientific journals. Starting in 1982 he organized the first of a series of meetings on surface science in Austria, 3S '83, at Bundes-sportschule Obertraun in Upper Austria. The overwhelming success of this meeting called for a second meeting two years later; Braun started preparations for 3S '85 and continued his efforts even during his last weeks in the hospital.

RUDOLF DOBROZEMSKY
Austrian Research Center Seibersdorf
Universität Wien
Technische Universität Wien

Harmon Hastings Plumb

Harmon Hastings Plumb, former chief of the National Bureau of Standards temperature section, died on 9 March 1985 at the age of 60. Plumb was well known in the cryogenics community for his study of thermodynamic temperatures.

Plumb was born on 10 July 1924 in Hornellesville, New York. His collegiate studies were interrupted by serv-

ice in the US Navy during World War II. He completed an AB in physics at Middlebury College in 1947 and received MS and PhD degrees in 1948 and 1954, respectively, at Northwestern University.

Upon completing his doctoral studies, Plumb joined the staff of NBS, where he studied the Kelvin thermodynamic temperature scale using the speed of sound in He^4 gas as an absolute thermometer and the germanium resistance thermometer for transferring the absolute scale. This work provided a provisional but internationally recognized temperature scale for the range 2–20 K. Plumb's laboratory served for more than a decade as the primary international source of thermometer calibrations in that temperature range.

From 1966 to 1974 Plumb served as chief of the NBS temperature section. During that time he organized a cohesive temperature staff for disseminating to the nation's thermometry community the new International Practical Temperature Scale of 1968 for the range 13.81–1337.58 K. He also bore major responsibility for the Fourth Symposium on Temperature, Its Measurement and Control in Science and Industry (1971) as head of the program committee and as chief editor for the resulting proceedings. He vigorously supported both research to improve the 1968 temperature scale and education of the thermometry community to make more meaningful temperature measurements. Plumb retired from NBS in 1980.

JAMES F. SCHOOLEY
Center for Basic Standards
National Bureau of Standards

George E. Moore

George Edward Moore, professor emeritus of physics at the State University of New York at Binghamton, died 18 September 1984 at the age of 80. Moore was born in Pittsburgh, Pennsylvania, in 1903. He received his bachelor's degree from the California Institute of Technology in 1927 and his master's degree in physics from Columbia University in 1931.

As a member of Bell Laboratories from 1927 until his retirement in 1966, Moore studied a variety of problems related to the physics and chemistry of electron tubes. Much of the great improvement in electron-tube performance and life during this interval is traceable to his work.

During his early years at Bell Labs, Moore collaborated with such men as J. A. Becker and H. W. Webb of Columbia. During the war years he made important contributions to the development of magnetrons for radar. In 1950

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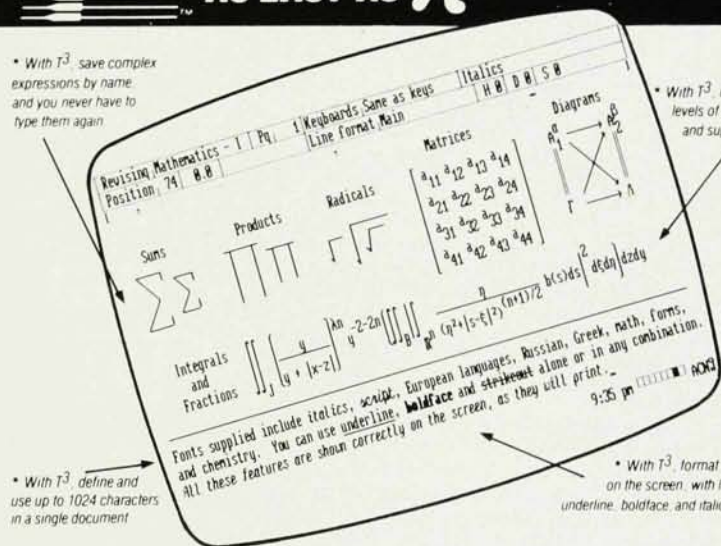
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