

WE HEAR THAT

professor. He continued his work with lead samples and also expanded his interests to include isotope separation with a thermal diffusion column he constructed. The enriched ^{13}C that was one of the separation products led to his participation in biological and physiological experiments. In 1939, at the request of Enrico Fermi, Nier separated sufficiently large samples of ^{235}U and ^{238}U that the isotope responsible for fission could be determined. During this period Nier designed a new mass spectrometer with a 60° sector magnet that could perform as well as the earlier instruments with 180° sector magnets. The savings in magnet costs and power consumption and the simplicity of the design brought mass spectrometers to a much broader group of scientists than had been using them previously.

During World War II Nier contributed to the Manhattan Project by analyzing uranium isotopes in enriched samples. The development of the helium leak detector and other instrument designs were products of his great engineering skills.

After the war years Nier returned again to the University of Minnesota. His research interests now centered around the radioactive decay of ^{40}K for geological age determinations, studies of the variation of the $^3\text{He}/^4\text{He}$ isotope ratio, determination of atomic masses and the analysis of helium isotopes produced in meteorites by cosmic-ray bombardment.

In the early 1960s the excitement of space exploration stimulated Nier to design and build small mass spectrometers for exploration of Earth's upper atmosphere. Results from his rocket-borne instruments showed in greater detail the separation of gases above 100 km, the dominant role of atomic oxygen in the upper atmosphere and the strong seasonal variation of helium. His research on the upper atmosphere culminated in the very successful Atmosphere Explorer satellite series. Data from his three instruments mounted on AE satellites provided new insights into the physics and chemistry of high-altitude neutral gases.

The 1976 Viking mission to Mars was one of the great success stories of Nier's scientific career. Two instruments that he designed provided the first gas analysis of the Martian upper atmosphere, with immediate practical consequences for the following lander operation and with scientific implications for modeling the evolution of the Martian atmosphere. The anomaly in the nitrogen isotope distribution in the Martian atmos-

phere was discovered by Nier.

Following his retirement from teaching in 1980, Nier continued to be an active researcher. During the past few years he had been studying helium isotope ratios in interplanetary dust particles. He had spent the morning of his accident in his laboratory.

Al Nier was not only an outstanding researcher who made significant contributions to many different scientific fields; he was also a dedicated teacher. His enthusiasm for science, dedication to the task at hand, friendly spirit and careful teaching strongly influenced students, staff and colleagues alike. His colleagues at the University of Minnesota—faculty, students, secretaries, technicians—and many other friends around the world will miss him very much.

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Theodore Soller

Theodore Soller, longtime chairman of the Amherst College physics department, died in Flagstaff, Arizona, on 20 February 1994.

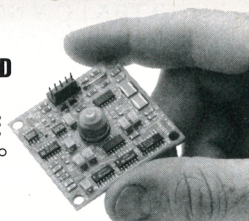
Born in Youngstown, Ohio, in 1899, Soller did his undergraduate work at Oberlin College in Ohio and received his PhD from the University of Wisconsin. In 1928 he joined the faculty at Amherst, where he remained until his retirement in 1967.

During World War II Soller was a group leader at the MIT Radiation Laboratory and was a coauthor of *Cathode-Ray Tube Displays*, one of the famous Radiation Laboratory "red books" that emanated from that critical radar research program. On his return to Amherst in 1946 he realized that it was important for the vitality of a small college department to have an active research program; at that time serious physics research was not common at small colleges like Amherst. Soller chose low-temperature physics to be the center of Amherst's research activities, although it was not his own research field, and liquid helium was then produced at only a handful of laboratories in the world.

In 1947 he recruited Yale graduate students William Fairbank and Bruce Benson to the Amherst faculty. Together they built a helium liquefier, which continued to operate until 1969, when the department moved into a new building. (That building was one with whose design details Soller was lovingly involved, even

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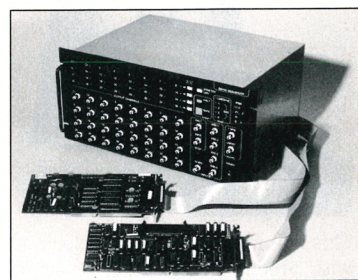
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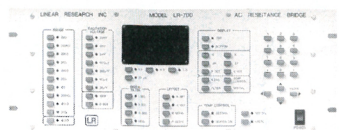
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though he knew he would be in retirement before it was completed.)

³He was an even rarer commodity in 1947 than was liquid ⁴He. Soller's group planned to start with ordinary helium from natural gas wells and to concentrate ³He from its normal concentration of 10⁻⁶ by taking advantage of the superfluid properties of helium. Amherst would then become one of only three or four laboratories in the world doing research on the low-temperature properties of ³He.

Dreams of Amherst preeminence in this field were severely affected by the commercial production of helium liquefiers by the Arthur D. Little Company and by the decision of the Atomic Energy Commission in the early 1950s to release to researchers at non-AEC laboratories small quantities of nearly pure ³He (obtained as a decay product of tritium). During the succeeding years, Soller and a series of younger colleagues carried out experiments in a range of low-temperature topics—from the nuclear hyperfine contributions to the heat capacities of rare earth metals below 1 K to the superfluid properties of ⁴He itself. The tradition of cryogenics research at Amherst College that Soller initiated in 1947 continues to this day.

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Joseph Edmunds Henderson

Joseph Edmunds Henderson died on 23 May 1994, at the age of 93.

Henderson was born in New Cumberland, West Virginia, on 16 October 1901. He obtained a BS in 1922 from the College of Wooster, Ohio, and a PhD in physics in 1928 from Yale, where he served as an instructor from 1927 to 1929. He then joined the physics faculty of the University of Washington as an assistant professor; he became a professor in 1942.

Henderson's career fell roughly into two segments, demarked by World War II. At Yale he carried on research into the properties of soft x rays. He brought to the University of Washington a vigorous research effort, initiating projects on topics that included conduction of electricity through gases, field emission and Čerenkov radiation. Henderson and his students began a nuclear physics research program by using at night the nearly 1 MeV voltage from a Cockcroft-Walton accelerator at the Swed-

ish Hospital in Seattle, built for x-ray treatment of tumors. The war brought to a halt this nascent effort. The first physics PhD at the university was awarded in 1935 to one of Henderson's students.

In 1941 Henderson joined the bomb proximity-fuze project as principal physicist at the National Bureau of Standards in Washington, DC, and later he became a consultant to the National Defense Research Committee in the Carnegie Institution's Department of Terrestrial Magnetism. In 1943 he returned to the University of Washington and a year later responded to a request by the US Navy to establish the Applied Physics Laboratory to solve a nasty torpedo-exploder problem. The laboratory went on to make many valuable contributions, including significant underwater pressure measurements at the Bikini test of a thermonuclear bomb. Under Henderson's directorship it developed a special rapport with the US Navy.

Henderson made many contributions to the capabilities of the Navy, but perhaps his most significant role was as an objective critic, exercising a scientific skepticism that the armed services sorely needed. The influence exploders (triggered by a ship's magnetic field) of today's Navy torpedoes bear his stamp. He also was a prime mover in the establishment of an acoustic underwater tracking range useful in many kinds of tests and in the improvement of the antisubmarine weapon system. At the Navy's request he served on several important boards and councils. Henderson retired from the directorship of the APL in 1969 but continued as a scientific adviser until his death.

Henderson was alive to many applications of physics and had numerous connections with business and industry. In their early days in Seattle he and his wife, Evelyn Colpitts Henderson, also a Yale PhD in physics, carried on extracurricular industrial research in their home. He became a director of the John Fluke Manufacturing Company (Fluke had been a student of his) and of the Field Emission Corporation (whose founder, Walter P. Dyke, had also been his student).

Joe Henderson will long be remembered by his many students, colleagues and Navy and business associates for his curiosity and persistence, combined with a warm, genial personality.

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