

WE HEAR THAT

phenomenological approach to quantum chromodynamics in a nice "Migdalian" way, incorporating the ideas of strings and instantons. He predicted several interesting experimental consequences of his ideas. Migdal was very enthusiastic about this work, which engaged him until his death.

Arkady Migdal was a great teacher. He published several books that were translated into English, including a charming little textbook *Qualitative Methods of Quantum Mechanics*. He also influenced a book published by his former students Joseph Goldman and Michael Krivchenko, a book that consists of one of the best sets of problems in quantum mechanics.

Actually, Migdal influenced many fields as well as many people. He radiated intelligence, wisdom, charm and strength. He was a wonderful friend: In any difficult situation, be it in life or in science, we asked his advice and always, without exception, heard from him something wise and simple. Born in an unhappy country at an unhappy time, he managed against all odds to create an intense and brilliant life. For many of us, who still mentally talk to him, his life is a stimulating example.

VLADIMIR GRIBOV
ANATOLY LARKIN

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Paul E. Klopsteg

Paul Ernest Klopsteg, founder of the American Association of Physics Teachers, died on 28 April 1991, a little more than a month short of his 102nd birthday.

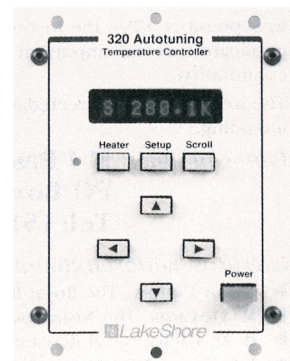
Klopsteg's contributions to the scientific community were remarkably diverse and productive. He was a notable administrator and organizer, particularly skilled in research and development, and a prolific inventor (he came to hold more than 50 patents). He was insistently interested in teaching and in the contributions of physics to the rest of society. He headed a number of important and effective committees, both governmental and nongovernmental. He founded AAPT in 1930, and he was instrumental in its becoming a found-

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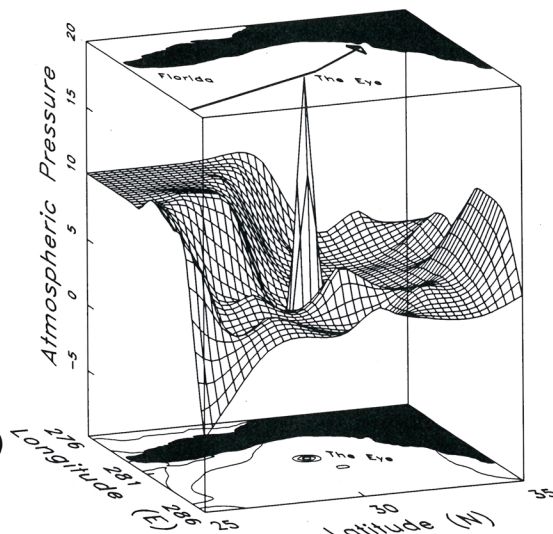
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ing member society of the American Institute of Physics. He sat on AIP's governing board for many years and was chairman of the board from 1941 through 1947.

His interest in physics extended to his favorite sport: He was expert in the theory and practice of archery, and he designed a bow that revolutionized archery tournaments. His collection of bows and arrows was donated to the Smithsonian Museum of History of Science and Technology, and his collection of rare books on archery and its history was given to the University of Oklahoma.

Born in Henderson, Minnesota, Klopsteg learned the printing trade to put himself through the University of Minnesota, where he earned a PhD in physics in 1916. His interests in physics education and the utility of physics for other scientific disciplines date from his student days: During that period, for example, he devised for a fellow graduate student in psychology a simple chronograph to measure short time intervals. As an engineer in the Army Ordnance Department during World War I, he thought of using these methods for measuring projectile velocities. He was thus, as he said later, "probably the first individual engaged in research and development in the Ordnance Department."

After the war Klopsteg went to work for Leeds and Northrop, a company that specialized in electrical measuring instruments, and in 1921 he moved to Central Scientific Company in Chicago to establish a research and development department and to look after manufacturing. Klopsteg was associated with Cenco in various positions (including president) until 1955.

In 1944 he became professor of applied sciences and director of research at the Technological Institute of Northwestern University, although he maintained his relations with Cenco. He retired from Northwestern in 1954 for reasons of what he referred to as "mandatory senility" (he was 65) but continued to serve as a consultant there.

These positions constituted only his "regular" employment. During World War II Klopsteg was chief of the physics division of the Office of Scientific Research and Development. He made extended visits to Pacific outposts for the Office of Field Services, whose function was to facilitate communications between OSRD and the military commanders.

In 1945 he was pressed into service on what became the National Research Council's Committee on

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Paul E. Klopsteg

Prosthetic Devices, which he headed for ten years. He co-edited a book, *Human Limbs and Their Substitutes*, that recorded the committee's accomplishments.

Klopsteg was chairman of the advisory board of governors of Argonne National Laboratory from 1948 to 1950 and was a member of the Atomic Energy Commission's personnel security review committee from 1953 to 1962. During the 1950s he also helped get the National Science Foundation under way, and he served as associate director until 1958.

Beginning in 1958 Klopsteg headed the National Academy of Sciences Committee on Atmospheric Sciences (he saw to it that the name was changed from mere "Meteorology"), whose recommendations resulted in the establishment of the National Center for Atmospheric Research in Boulder, Colorado. He was a member of the executive committee and a trustee for the related University Corporation for Atmospheric Research from 1964 to 1967.

In view of the breadth of Klopsteg's interests in science it is not surprising that he was heavily involved with the American Association for the Advancement of Science. He was a member of the AAAS council for many years and president of the association in 1959. His devotion to physics teaching was unwavering—he looked back on the founding of AAPT as the greatest satisfaction of his professional career. He deplored the inferior position teaching was accorded compared with research in the colleges and universities, and in an effort to raise the prestige of teaching he established what became the AAPT Oersted Medal for notable

contributions to teaching.

Klopsteg's contributions to physics itself lay mainly in instrumentation, in applications and in the relation of physics to other research fields. While the specific instruments he designed have largely become outmoded, several of the institutions he helped to form have flourished.

MELBA PHILLIPS
New York, New York

Stephan Berko

Stephan Berko, a professor of physics at Brandeis University and an innovator in the use of positrons to study condensed matter, died at his home in Wellesley, Massachusetts, on 15 May 1991.

Berko was born 16 December 1924 in Oradea, Romania, and spent his youth in the town of Sighet. In the spring of 1944 he and his entire family were transported along with the large Jewish population of Sighet to Auschwitz. He was transferred to the ghetto in Warsaw and finally to Dachau. Liberated by the US Army in 1945, he was the sole survivor of his immediate family.

After some time as a UN volunteer organizing schools in Munich, Berko enrolled at the Technical University of Munich in 1946. He won a fellowship from the US Hillel Foundation and went to the University of Virginia, where he received a BA in physics in 1950 and a PhD in physics in 1953, after completing a thesis on cosmic-ray muons under the direction of Frank L. Hereford. From 1953 to 1961 he held postdoctoral fellowships at Princeton University and at the Bohr Institute, Copenhagen, and joined the physics faculty at the University of Virginia.

In 1961 Berko moved to Brandeis University to initiate a program in experimental physics. He served as chairman of the physics department from 1965 to 1967. In 1978 he was appointed the William R. Kenan Jr Professor of Physics.

Berko's research concerned the study of fundamental interactions, many-body effects and the chemistry and physics of positrons in ordinary matter, especially the chemical and other interactions of positrons with matter. In a seminal paper in 1958, Berko and J. S. Plaskett comprehensively recast the description of the angular correlation of annihilation radiation in solid-state terms that have since provided the foundation for much additional work on oriented single crystals. Berko played a leading role in the extension of angular



Stephan Berko

correlation techniques to the study of magnetic structures using spin-polarized positrons and to the use of large-area detectors to measure the Fermi surfaces and electronic structures of disordered alloys and other materials. He and his student Howard Weisberg also made significant contributions toward the measurement of positron lifetimes in metals.

In 1974 Berko and his colleagues Karl F. Canter and Allen P. Mills Jr used a slow-positron beam to form positronium in vacuum and to measure the effects of quantum electrodynamics on its level structure. This work led to the study of the interaction of positrons with surfaces and to the discovery of more efficient ways to produce slow positrons. From 1982 to 1989 Berko worked with a group at the Brookhaven National Laboratory Reactor to study the interactions of slow positrons with solid surfaces using the two-dimensional angular correlation method. Berko was most recently involved in the study of high-temperature superconductors, the characterization of polymers and momentum density measurements on semiconductors.

In her opening remarks at a symposium honoring Berko on the occasion of his 60th birthday, Brandeis president Evelyn Handler thanked Steve for his active and deep concern for the university's philosophy and governance. In addition to his research and teaching, Steve served the university as chairman of the faculty senate and as faculty representative on the board of trustees. He was interested in all aspects of the university and was widely known as an excellent teacher, a respected critic and a warm friend. His masterful lecturing, his uncom-