Aside from his scientific career, Frank was an enthusiastic environmentalist. In the early 1960s, he played a major role in raising the money to purchase and protect an undeveloped 112-acre tract of natural forest in Niskayuna, a suburb of Schenectady. Named the Lisha Kill Natural Preserve, this lovely natural haven stands today as an appropriate monument to Frank, who had been the official steward of the preserve from its inception.

Throughout his life, Frank set for himself the highest standards of honesty and integrity and produced work of the utmost reliability. This gracious, likeable person is missed by the many scientists whose research he has strongly influenced and particularly by those of us who were lucky enough to have known him personally.

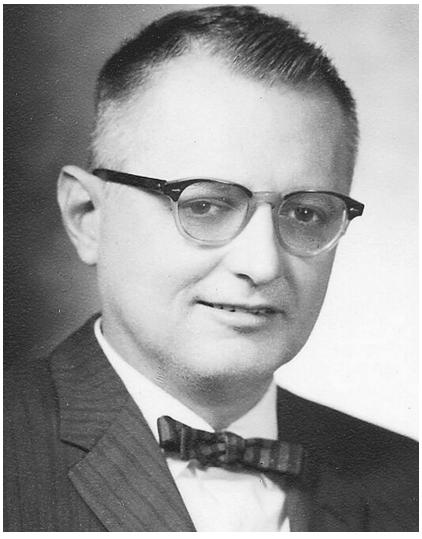
**George D. Watkins**
**W. Beall Fowler**
*Lehigh University*
*Bethlehem, Pennsylvania*
**Michael D. Sturge**
*Dartmouth College*
*Hanover, New Hampshire*

## Charles Earle Mandeville III

Charles Earle Mandeville III, educator, administrator, and experimentalist in low-energy nuclear physics, died in Socorro, New Mexico, on 14 January 2003 of complications from a stroke.

Born on 3 September 1919 in Dallas, Texas, Mandeville was valedictorian of his class at Adamson High School. He served as a private in the Texas National Guard 112th Cavalry band from 1936 to 1937 while attending Rice University, where he received a BA in 1940, MA in 1941, and PhD in 1943, all in physics. His PhD thesis, "The Energies of Some Nuclear Gamma-rays," was under the supervision of Harold A. Wilson. He was a fellow in physics at Rice while a graduate student. Until the end of World War II, he was a staff member at MIT's Radiation Laboratory, where he assisted in the advancement of American military radar. He returned to Rice as an instructor after the war, continued his earlier research involving gamma-ray sprectroscopy, and expanded his pursuits to include neutron scattering.

In 1946, Mandeville began his professional research career as a nuclear physicist with the Bartol Research Foundation of the Franklin Institute in Swarthmore, Pennsylvania. He participated in a unique program that allowed students from India who had an MSc in physics to conduct their doctoral research at Bartol and then submit their theses to their respective universities in India. More than a dozen students under his guidance benefited from that program. From 1950 to 1956, Mandeville was a visiting lecturer in radiological physics at the Philadelphia College of Osteopathic Medicine; he spent the summer months consulting with the US Naval Ordinance Test Station in China Lake, California. He served as an assistant director of Bartol from 1953 to 1959.



Charles Earle Mandeville III

His research interests involving alpha-, beta-, and gamma-ray spectroscopy led to his determination of properties of nuclear energy levels. His early pioneering work on beta decay of nuclei, from low $Z$ to high $Z$ elements, helped in calculating comparative half-life values, which were important in the formulation in 1949 of the single-particle shell model of nuclei. One aspect of his research was the use of photosensitive Geiger–Mueller counters to detect scintillation induced by gamma and beta rays, a precursor to the sodium iodide–photomultiplier combination for gamma-ray spectroscopy. Other work along that line included storage of energy in some activated alkali halide phosphors, luminescence of beryllium oxide, and phosphorescence of thorium oxide.

Yearning to return to his beloved South, he accepted the position of head of the physics department at the University of Alabama at Tuscaloosa in early 1959. For the next two years, he concurrently served as a consultant to the Army Rocket and Guided Missile Agency at Redstone Arsenal in Huntsville.

Mandeville subsequently took a job as a professor of physics at Kansas State University in Manhattan, working in that position until 1967. His research group used the university's Triga teaching reactor to produce short-half-life radioactive sources from isotopically enriched materials. While at KSU, he initiated efforts that culminated in the acquisition of a tandem Van de Graaff accelerator. He consulted during summers with the US Naval Radiological Defense Laboratory in San Francisco and with Kaman Nuclear, a division of Kaman Aerospace, in Colorado Springs, Colorado.

Mandeville then joined Michigan Technological University in Houghton as head of the physics department and, in 1975, became the director of special projects of the MTU energy research committee. At MTU, he continued his lifelong research interest in gamma-ray emissions. He also worked on a semiclassical model of ferromagnetism and taught basic physics until his retirement in 1984. Following his retirement, Mandeville and his wife relocated to Houston and later moved to Phoenix, Arizona, for three years before finally settling in Socorro.

A fellow of the American Association for the Advancement of Science, Mandeville served as a consultant, at various times, to a congressman, a nuclear power utility, and several other energy-oriented companies. He received a patent in 1957 for a device that determines the intensity of nuclear radiations.

Throughout his life, Mandeville enjoyed playing the piano and was an accomplished percussionist who was proficient in all the section instruments, including the xylophone and the spoons. He was lead percussionist of the Swarthmore Symphony Orchestra for eight years. His other interests included collecting coins; precious and semiprecious stones; 19th- and 20th-century American art glass; antique buttons; European hard-paste porcelain; art objects of gold, silver, and platinum; and original Japanese woodblock prints by Hokusai. He was an avid collector of Bakelite jewelry in his later years. He was also a budding novelist; his book *University* (Exposition Press, 1973) was based on his academic experience.

For both of us, he was our teacher and guide. We remember him as a man of high ethical standards.

**Vasant R. Potnis**
**Gary P. Agin**
*Michigan Technological University*
*Houghton* ■