

Research Institute in Princeton, New Jersey, and one of the founding members of the Division of High-Polymer Physics of The American Physical Society, died peacefully in Sudbury, Massachusetts, on 16 November 1984. He was 80 years old.

A native of Duluth, Minnesota, Lyons received his PhD from the University of Chicago and his MS and PhD from St. Louis University. He was one of the pioneers of research on the elasticity of rubber and the mechanical properties of polymeric materials, and he held a number of responsible industrial positions before taking up his appointment at the Textile Research Institute. His services to polymer physics and to physics in general were many and varied. A member of the organizing committee responsible for founding the APS Division of High-Polymer Physics in 1944, Lyons served continuously as its secretary for the next 24 years, a post including for much of that time the duties of treasurer; in his final year before retirement from professional life he served the division as its chairman. He was a man of wry good humor and steady sound judgment, also a strict parliamentarian and master of a precise literary style; the success of the division through its formative years owed much to his benevolent, but firm, guiding hand. His talents were called upon in a broader context when, in collaboration with John A. Wheeler (then president of APS), he was responsible for planning a major reorganization of the society in 1966. Lyons was the principal draftsman of the new constitution adopted by the society at that time.

To those who knew him well, it came as no surprise that after his retirement Lyons took a lively interest in the Sudbury Historical Society and in the preservation of the town's ancient documents. To this activity he brought the same good judgment and meticulous

LYONS



care that characterized his many years of service to the physics community.

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Francis G. Slack

Francis G. Slack, former Landon C. Garland Professor of Physics and retired chairman of the department of physics and astronomy at Vanderbilt University, died on 26 February 1985 at the age of 88. He was born in Superior, Wisconsin, and received his BS from the University of Georgia and his PhD in physics from Columbia University. He was a pilot in the US Air Force in World War I.

Slack spent 1926-27 studying in Germany under Arnold Sommerfeld. There, in the year that Erwin Schrödinger published his revolutionary work, Slack published one of the first experimental tests of wave mechanics. He then returned to Columbia as a lecturer. In 1928 he came to Vanderbilt as an associate professor, and in 1939 he became Landon C. Garland Professor of Physics and department chairman.

When Slack came to Vanderbilt, the region was singularly backward in physics. From 1895 until 1927, no paper in the *Physical Review* came from a physicist in the Southeast. Out of his deep commitment to seeing physics flourish in Tennessee and the Southeast on a level comparable to that in the nation's centers of physics research, he helped transform physics in this region. He immediately established at Vanderbilt strong teaching and research laboratories and, from 1929 on, published regularly in the leading physics journals. In 1931, Slack, Jesse Beams of the University of Virginia and Fred Allison of Auburn were the first physicists from southeastern universities to be elected fellows of The American Physical Society.

Under Slack's leadership the Vanderbilt physics and astronomy department expanded from one to nine faculty members active in research, including a future Nobel laureate, Max Delbrück. He established a PhD program in 1946, and directed its first PhD thesis.

His energetic leadership was not limited to Vanderbilt. In 1928 there existed no organization for physicists in the Southeast. Realizing how meetings of a society could encourage the development of science, Slack helped organize what in 1937 became the Southeastern Section of The American Physical Society. He served as the first secretary of the Southeastern Section, as its chairman in 1940 and as a member of



SLACK

the executive committee from 1949 to 1953.

In 1946 Slack played a key role in the creation of the Oak Ridge Institute of Nuclear Studies, now Oak Ridge Associated Universities; he was one of the five original incorporators of the institute.

Slack's most significant work came in two areas of nuclear science. First, while on leave at Columbia in 1938-39, Slack was working with a group that included John R. Dunning, Eugene Booth, Herbert L. Anderson and Enrico Fermi. When Niels Bohr brought news in early 1939 of the experiments of Otto Hahn and Fritz Strassmann suggesting the fission of uranium by neutrons, this group quickly provided the first confirmation of fission. Booth, Dunning and Slack published four very important papers on uranium fission, including ones proving that the fissioning element was U^{235} and that the process occurs by very slow neutrons, not fast ones.

Second, during World War II Slack was a division director in the Manhattan Project. He worked to solve the problem of separating the 1% of fissionable U^{235} from the very abundant U^{238} . In one of the histories of the Manhattan Project, Harold C. Urey, director of the laboratory, wrote: "Slack made an outstanding contribution to the scientific and administrative work of the project. Through his efforts the division was organized and scientific work of a quality performed that in ordinary time would not seem possible." Slack has not been widely recognized for this work because it is still highly classified. However, Dunning commented that "Slack's brilliant work on barrier development was the fundamental basis for the success of the diffusion process for separation of U^{235} ." Indeed, Slack's barriers became the centerpiece of the enormous K-25 diffusion plant at Oak Ridge, which has been of inestimable value in the nation's nuclear programs.

Slack returned to Vanderbilt in 1944

to resume teaching. A dedicated teacher, he believed in careful planning, meticulous attention to details, accuracy as a source of new discovery, and proper care of equipment as a way to conserve funds and avoid frustration in experiment.

In 1951 Slack retired early, but he continued his interest in education, physics and his former students and colleagues, in particular through attendance at meetings of the APS South-eastern Section. In 1977 Vanderbilt University inaugurated the Slack Lecture Series in his honor.

To be in his presence was to feel the force of his personality. A man of rugged integrity, he was candid in his assessment of scientific problems and human affairs. He retained to the last his critical intellect, quick wit and interest in people and events. His death takes from us a highly esteemed mentor and an irreplaceable colleague.

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Norman H. Horwitz

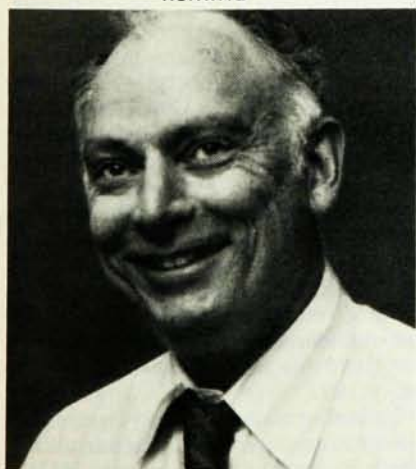
Norman H. Horwitz, director of medical physics and engineering at William Beaumont Hospital in Royal Oak, Michigan, died 28 December 1985. He was 63 years old.

He was a lifelong resident of Detroit and its environs, except for his military service during World War II (1942-46). He served in the Pacific theater and received four decorations, including the Bronze Star.

Horwitz earned his bachelor's (1948), master's (1949) and doctoral (1963) degrees in physics from Wayne State University in Detroit. His doctoral thesis was on ultrasonic attenuation in superconducting metals.

In 1953, after working for the Army at the Detroit Arsenal, Horwitz began his career in medical physics, entering

HORWITZ



the then-infant field of nuclear medicine. One of his first contributions was the development (1955) of a photographic method for recording scintillation-scanning data. Interest in imaging *in vivo* distributions of radionuclides led to his invention of the "spintaricon," a device similar to a spark chamber, which was used to image the thyroid gland. Whether combining solid-state detectors with catheters to monitor *in vivo* uptakes, applying the mechanics of a magic illusion to automatic sampling devices, putting principles of pneumatics to use in patient-care systems or rebuilding outdated laboratory nmr equipment so that it would produce microimages, Horwitz displayed a unique ability for problem solving.

In 1965 he came to Beaumont as head of the applied-physics section. He firmly believed that medical physics should not be limited solely to radiological physics, for he realized that the principles of physics could and should be utilized in all areas of medicine. In 1970, he established the department of medical physics and engineering, bringing together physicists, engineers and instrument makers to support all the services within the hospital. Horwitz served as chairman of the department until his death.

In addition to his departmental responsibilities, he helped develop the Research Institute of the Beaumont Hospital, serving as its director from 1972 until 1976, and as its assistant director from 1976 until his death.

Horwitz was a dedicated teacher who instilled the desire to learn in students, colleagues and friends. He was an extraordinary physicist as well, with a natural ability in mechanical engineering and an insatiable curiosity. He had an uncanny command of the scientific literature. Many a colleague will remember describing to him a "new" idea, only to hear in return his friendly growl of "It has already been done," followed by the literature citation. He demanded excellence of himself and asked of his colleagues that they work at their full potential. Horwitz will be sorely missed but he leaves a legacy of original, innovative ideas and methodology. His life made a difference to those of us who knew him and, in fact, to many who did not.

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Lee J. Kieffer

Lee J. Kieffer, a physicist at the National Bureau of Standards, died unex-

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