JAMES W. MAYER

1981 VON HIPPEL AWARD WINNER

John M. Poate (left) and Prof. James W. Mayer

The 1981 Von Hippel Award of the Materials Research Society was presented to Prof. James W. Mayer on Nov. 17 at the Boston meeting. Dr. John M. Poate, past president of the Society, presented the award, which consists of a $1,000 check and a plaque with mounted ruby crystal, and gave a short biographical sketch. Mayer attended Evanston, Ill., Township High School, and graduated from Purdue University in mechanical engineering in 1952. He then spent two years in the Army before returning to the Physics Department at Purdue for graduate studies. His Ph.D. (1960) dissertation work was on the response of surface barrier detectors to ionizing radiation and was carried out under the supervision of Professor K. Lark-Horowitz. This was an exciting and important time in the development of solid-state detectors. In fact, Mayer was the first to demonstrate that a surface barrier detector gives a linear response to α-particle irradiation.

Mayer was with Hughes Aircraft Company from 1959 to 1967 and carried out research on detectors and ion implantation. During this time he obtained the first patent on the use of Lithium-drifted detectors for spectrometers. He was also, from 1965 to 1967, engaged in studying ion implantation phenomena by Rutherford backscattering and channeling techniques at Chalk River, Canada.

Mayer was professor of electrical engineering at Caltech from 1967 to 1980, where his research interest centered on particle-solid interactions and thin film reactions covering such topics as implantation, ion-beam mixing, silicide formation and epitaxial growth of semiconductors (thermal and laser annealing).

He was appointed Francis Norwood Bard Professor of Materials Science and Engineering at Cornell University in 1980 and is currently engaged in creating a new tandem accelerator laboratory to pursue his research. Mayer has had a profound influence on the development of modern material science with particular emphasis on semiconductor materials. Almost every area he has worked in has turned out to be important. For example, his research on implantation identified the damage and epitaxial regrowth phenomena long before the technique was accepted as an integral part of the semiconductor industry. He has been a pioneer in the use of ion beam techniques for materials analysis.

Mayer has coauthored six books and has published over three hundred papers. He is a fellow of the American Physical Society and IEEE and a member of the Bohmische Physical Society.

Prof. Mayer has always taken a strong interest in the well-being of students and colleagues. He was Master of Students at Caltech from 1975 to 1980 and scuba instructor from 1970 to 1980. His wife, Betty and five children have always participated in his research activities and have fed and boarded an astonishingly large number of colleagues. Betty is assistant professor at the Campus School, State University of New York.

Mayer gave a thirty-minute address at the awards ceremony entitled "Conflict or Collaboration: Materials Science in University and Industry." He pursued two broad themes. First he showed with examples from his own research what an exciting time it is to be involved in materials. Secondly, he discussed the more sobering aspects of scientific funding and emphasized the importance of university-industry collaboration in tackling the more expensive research projects.

[Editor's note: Highlights of Prof. Mayer's address will be presented in the next issue of the Bulletin.]

W. CONYERS HERRING

1980

W. Conyers Herring is professor of applied physics at Stanford University. He has had a seminal influence on materials science and solid state physics, contributing to the understanding of solid surfaces that underpins the fields of crystal growth, sintering and plastic flow at high temperatures. Together with J. K. Galt he realized and demonstrated that whiskers of high crystalline perfection would exhibit extraordinary mechanical properties.

Prof. Herring received his Ph.D. in physics from Princeton in 1937. He taught at MIT, Princeton and the University of Missouri, and from 1941 to 1945 was a member of the War Research staff at Columbia University. After 30 years of service at Bell Laboratories, he joined Stanford in 1976.

DAVID TURNBULL

1979

David Turnbull has been Gordon McKay Professor of Applied Physics at Harvard since 1962. A physical chemist by training, Professor Turnbull's research has encompased a broad range: thermionic emission, thermodynamic properties of gases at high pressures, corrosion in non-aqueous media, diffusion in metals, kinetics of nucleation in solid state transformation, solidification, theory of liquid and glass.

Dr. Turnbull received his Ph.D. in physical chemistry from the University of Illinois in 1939. He began his career as a teacher at Case Institute of Technology, then joined the research laboratory of the General Electric Company in 1946, where he remained until he joined the Harvard faculty.

W. O. BAKER

1978

W. O. Baker joined Bell Laboratories in 1939 as a member of the technical staff, rising steadily to become its president in 1973. Despite a rigorous schedule of research into solid state materials and macromolecules, dielectric and dynamic mechanical properties of crystals and glasses, information processing technology, and plastics, fibers and natural and synthetic rubbers, he has long devoted himself to numerous civic, governmental and scientific committees and commissions.

Dr. Baker received his Ph.D. in physical chemistry from Princeton in 1938, having taken his undergraduate training at Washington College. Washington awarded him its honorary Doctor of Science degree in 1957; at last count, seventeen other institutions brought honor to themselves with similar awards.

ARTHUR VON HIPPEL

It was the pioneering research, and the unfettered spirit, of Arthur Robert Von Hippel that led the Society to create the award which bears his name. Emeritus Professor of the Massachusetts Institute of Technology, Dr. Von Hippel's research into dielectrics, semiconductors, ferromagnetics and ferroelectrics resulted in the publication of two visionary books, *Molecular Science and Molecular Engineering* and *Molecular Designing of Materials and Devices*.

Von Hippel studied electrophysics at the University of Goettingen, which granted him the Ph.D. in 1924. After a decade of teaching and research in Europe he joined the faculty of MIT in 1936. It was in his lab that his vision of scientists working cooperatively to solve the mysteries of materials from the atomic to the microstructural level first challenged the parochialism that had prevailed before and demonstrated the utility of the interdisciplinary approach that the Society hopes to foster and embody.