we hear that

accepted his current position in 1973 after having been affiliated with RCA (Princeton, N.J.) and F. Hoffman–La Roche (Basel, Switzerland). Helfrich's recent research has been concerned with the physics of membranes.

Kurt J. Linden has been named manager of the solid-state device section of Laser Analytics Inc; prior to this appointment, Linden had been a senior member of the R&D staff and group leader at Raytheon Co (Waltham, Mass.).

Formerly with Itek Corp, **Julius Feinleib** has joined the staff of Walter J. Schafer Associates (Wakefield, Mass.) to head a program for the development of experimental systems for high-energy laser applications.

Peter A. Wolff has been named the new director of the Massachusetts Institute of Technology's Research Laboratory of Electronics. Wolff was formerly head of the physics department's solid-state and atomic-physics division and director of the MIT Center for Materials Science and Engineering.

In September **James E. White** will join the faculty of the Colorado School of Mines as the first Charles Henry Green Professor of Exploration Geophysics; White is currently Nelson Professor of Geological Sciences at the University of Texas at El Paso.

At the Energy Research and Development Administration, **Maurice J. Katz** has been appointed special assistant to the Assistant Administrator for Solar, Geothermal and Advanced Energy Systems; Katz was formerly technical assistant to the director, Division of Controlled Thermonuclear Research.

The University of Maryland, College Park has announced the promotion of five associate professors to the rank of professor: **Douglas G. Currie** in atomic physics and quantum electronics; **Bice S. Zorn** in high-energy physics; **Roger A. Bell, William K. Rose** and **Benjamin M. Zuckerman,** all in astronomy. **Thomas Dombeck** and **Jerome Lynn** have been appointed assistant professors at the University.

Ellen R. Domb, a research associate at the University of Nebraska, has been appointed assistant professor of physics at Harvey Mudd College, Claremont, California.

The following changes in the Pennsylvania State University department of physics have been announced: **Howard Grotch** has been promoted from associate professor to professor, **Milton W. Cole** (Brooklyn College of The CUNY) has been appointed associate professor and **Jeffrey Lannin** (University of Delaware) and **Toshio Sakurai** (Bell Laboratories) have been appointed assistant professors.

Frederick E. Mills, formerly of the accelerator section of Fermilab, has recently been appointed associate director of the Controlled Thermonuclear Research program at Argonne National Lab.

An applied photochemistry division has been formed at Los Alamos Scientific Laboratory; **C. Paul Robinson** has been named division leader and **Reed J. Jensen** has been chosen alternate division leader. The responsibilities of the division include laser isotope-separation research.

Addenda

Several members of AIP member societies were omitted from the announcement of newly elected members of the National Academy of Engineering (June, page 62). They are **Alfred M. Freudenthal** (The George Washington University), **Dayton H. Clewell** (Mobil Oil Corp), **Julian D. Cole** (University of California, Los Angeles), **F. J. Corbató** (Massachusetts Institute of Technology), **Robert L. Johnson** (McDonnell Douglas Astronautics Co), **Gordon S. Kino** (Stanford University), **John D. MacKenzie** (UCLA), **Gordon E. Moore** (Intel Corp), **Johannes Weertman** (Northwestern University), **Marvin Camras** (IIT Research Institute), **Franklin S. Cooper** (Haskins Laboratories) **Ira Dyer** (MIT), **Henning von Gierke** (Aerospace Medical Research Laboratory) and **Richard T. Whitcomb** (National Aeronautics and Space Administration, Langley Research Center).

Hallowell Davis, past president of the Acoustical Society of America (ASA) and professor emeritus of physiology at Washington University School of Medicine, was among the National Medal of Science recipients in 1975 (for other winners, see August, page 71). He studied at Harvard University and joined the department of physiology there in 1923. From 1927 to 1946 he served on the faculty of Harvard Medical School; he then accepted a post at Washington University School of Medicine. An active member of ASA, Davis served on the executive council, 1945–46, was president in 1953–54 and received the Acoustical Society's Gold Medal in 1965.

DAVIS

obituary

Markus Reiner

Markus Reiner, professor of mechanics at the Technion-Israel Institute of Technology, Haifa, died 25 April at the age of 90. He was a founder of the study of rheology and made many contributions to the field since its inception in 1928.

Reiner was born 5 January 1886 in Czernowitz, Austria-Hungary. He was awarded the ingenieur degree from the Technische Hochschule in Vienna in 1909 and a Doctor of Technology degree just before World War I. Following service as a lieutenant in the Austrian Army, he immigrated to Palestine in 1922. For 25 years, he was employed by the Department of Public Works in Jerusalem, which was then under British Mandate government. As chief construction engineer he worked on many interesting problems such as the structural support for the Church of the Holy Sepulchre and the restoration of Herod's irrigation channels, which are located in Jericho.

REINER

In 1926 he published a paper that attracted international interest—in it Reiner presented a theoretical treatment

of the flow through a tube of an "elastic fluid" (a material which flows only under a shear stress greater than a yield stress).

Reiner visited Lafayette College, Easton, Penna. in 1928 at the invitation of Eugene C. Bingham. During this visit Bingham became so impressed by the importance of the flow and deformation of materials (particularly those that do not follow the classic laws) to fields as divergent as chemistry and civil engineering that he gave this branch of physics a special designation, "rheology."

As a result of these and other discussions, Reiner and Bingham became leading figures in the formation of the Society of Rheology in the US in 1929.

Of the more than 150 papers that Reiner published on rheology, his most important contribution was work on nonlinear fluid and solid behavior. He developed the theory of an incompressible fluid for which the stress tensor is an arbitrary matrix polynomial function of the rate-of-strain tensor, and showed in 1945 that the Hamilton–Cayley formula could be used to reduce this to a quadratic tensorial dependence. This paper, as one historian of science put it, "begins the rebirth of continuum mechanics as a rational science."

In the middle 1950's he developed a "centripetal pump" for air. One type had two closely spaced, parallel coaxial discs—when one of them is rotated at high speed, air flows into the gap from the edge of the discs and out through a hole at the axis. Reiner attributed this phenomenon to the existence of normal stress effects in the air. Others have proposed explanations based on Navier–Stokes equations.

Science was only a hobby with Reiner until he was appointed professor of mechanics at the Technion in 1948. This post he held until his death.

He concerned himself with questions of rheological nomenclature and classification. He introduced terms such as the Deborah number ("the mountains flowed before the Lord," Judges 5:5) and the teapot effect, which were at once appropriate and attention-getting.

His *Ten Lectures on Theoretical Rheology* was the first textbook on the subject. This and several of his six other books were translated into other languages. Forty-six of his papers were collected in one volume as *Selected Papers on Rheology*.

He was a member of the Israel Academy of Sciences and Humanities. Reiner received the Weizmann Prize of Tel Aviv in 1956 and the Israel Prize in 1958.

A Festschrift published in honor of his 80th birthday attracted authors from many countries. He was active well into his 80's—in him was fulfilled the Talmudic expression, "At eighty he had the gift of special strength."

HERSHEL MARKOVITZ
Carnegie–Mellon University □