

we hear that

versity of Toronto. From 1972 to 1977 he was also Chairman of the Engineering Science Department. He is a Fellow of the Optical Society of America and served as its president in 1976.

The recipient of the David Richardson Medal, which distinguishes applied optics contributions, is to be Abe Offner of the Perkin-Elmer Corporation. Offner studied at Western Reserve University, where he received a BA in 1930 and an MS in 1931. His technical career plans having fallen victim to the depression, he worked as a library assistant until 1939. Then he joined the J. A. Maurer Company as a physicist. He remained there until 1947, when he joined Perkin-Elmer, where he is principal optical scientist. He has "contributed to many pioneering optical achievements, . . . most recently the design of an all-reflective one-to-one pro-

jection system for wafer exposure operations in the semiconductor industry. In addition to innumerable designs for photographic lenses, telescope systems including Stratoscopes I and II and the current space telescope, he has made major contributions to the field of optimization of optical designs by computer. Among those designs for which he is best known are the null corrector, both refracting and reflecting for the testing of large aspheric mirrors."

The first Charles Hard Townes Award will be presented at the 1981 Conference on Lasers at Electro-Optics in Washington, D. C., in June. The award, which includes a cash prize of \$1000 provided by Bell Labs, was established to honor Townes, whose pioneering contributions to masers and lasers led to the development of quantum electronics. It will recognize outstanding experimental or theoretical work, discovery, or invention in the field of

quantum electronics. James P. Gordon of Bell and Herbert J. Zeiger of the Lincoln Lab at MIT will be honored "for their contributions to the successful operations of the first quantum electronics device, the ammonia maser. This work, published with Townes in 1954, launched the era of masers and lasers and initiated widespread activity in all branches of fundamental and applied optics, activity that continues at a rapid pace to this day."

Gordon received a BS from MIT in 1949, and from Columbia an MA in 1951 and a PhD in physics in 1955. After graduation he joined Bell Laboratories, where since 1959 he has been head of the Quantum Electronics Research Department. Zeiger studied at City College of NYC (BS, 1944) and Columbia (MA, 1948; PhD in physics, 1952). Since 1953 he has been a research physicist at Lincoln Labs, MIT.

Michaud receives 1980 Steacie Prize

Georges Michaud of the Department of Physics, University of Montreal, is the 1980 recipient of the Steacie Prize, which is awarded annually to a person under 40 years old who has made notable contributions to natural science research in Canada.

Michaud demonstrated the importance of diffusion in causing the anomalies in elemental abundances that are observed from the spectra of type-Ap stars—abundances that differ by several orders of magnitude from those observed in normal stars. He suggested that the strong magnetic fields of these stars tend to stabilize the plasma of the stellar atmosphere. With turbulence and convection minimized, it is possible to calculate the effects of radiative and gravitational forces on the different kinds of atoms and to show which diffuse toward the exterior (increasing their apparent abundance) and which diffuse toward the interior.

Michaud studied at the University of Laval (BA, 1961; BSc, 1965) and Caltech (PhD in astronomy, 1969). He was assistant professor (1969–73) and is associate professor of physics (since 1973) at the University of Montreal.

Schmidt, Peebles win RAS medals

The Royal Astronomical Society (London) has awarded Maarten Schmidt its 1980 Gold Medal and P. J. E. Peebles its 1980 Eddington Medal. Schmidt receives the Gold Medal in recognition of "outstanding contributions in astronomy, particularly investigations of the

mass distribution of the Galaxy," the investigation of the rate of star formation, the spectroscopic observation of quasars, and the study of the statistical distribution of quasars throughout the Universe. The medal was presented to Schmidt in London on 9 January 1981.

Schmidt was born in the Netherlands and received his PhD at Leiden University in 1956. In 1959 he became a staff member of the Hale Observatories and associate professor at Caltech. Since 1964 he has been professor there. He has also served on the staff of the Owens Valley Radio Observatory (1971–78) and at Caltech as Executive Officer for Astronomy (1972–75), Chairman of the Division of Physics, Mathematics, and Astronomy (1975–78) and Director of the Hale Observatories (1978–80).

The RAS awarded P. J. E. Peebles its Eddington Medal "for his work on the

large-scale structure of the universe and the hot big-bang cosmology." Peebles is a professor of astronomy at Princeton University.

John Gilman has been appointed Manager of Corporate Research at Standard Oil Company laboratories at the Amoco Research Center in Naperville, Ohio. Gilman, who holds a PhD in physical metallurgy from the Illinois Institute of Technology, was previously Director of the Corporate Development Center for the Allied Chemical Corporation in Morristown, N. J.

The National Bureau of Standards has awarded Precision Measurement Grants to William C. Oelfke of the University of Central Florida, who is studying quantum-limited measurements of mechanical oscillators, and to William H. Wing of the University of Arizona, who is building an electrostatic trap for neutral atomic particles. Each grant, paying \$25 000, may be renewed for up to two additional years.

Gary W. Carriveau, formerly the senior research physicist at the Metropolitan Museum of Art and visiting scientist at Brookhaven National Laboratory, has joined the Detroit Institute of Art's Conservation Services Laboratory.

The Ohio State University Physics Department has appointed Evan R. Suga-baker and Bunny C. Clark assistant professors beginning Fall 1980, and Ciriya-m Jayaprakash, presently at IBM, assistant professor, beginning Fall 1981.

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Stuart A. Rice has been appointed Dean of the University of Chicago's Division of Physical Sciences beginning July 1980. Rice is a professor in the departments of chemistry and biophysics and

theoretical biology, the James Franck Institute and the College. He succeeds Albert V. Crewe, professor in the departments of physics and biophysics and theoretical biology, the Enrico Fermi Institute and the College, who returns to full-time teaching and research.

obituaries

Harold C. Urey

Harold Clayton Urey is best known for his discovery, with F. G. Brickwedde and G. M. Murphy, of deuterium, for which he was awarded the 1934 Nobel Prize in chemistry. The discovery of heavy hydrogen, however, represents only the tip of a scientific iceberg. The profusion and diversity of his achievements during a career that spanned six decades mark Urey as one of the giants of twentieth century science. He will also be remembered for his intense interest in the social responsibilities of scientists.

Urey was born in Walerton, Indiana, on 29 April 1893. After graduation from high school he taught in country schools for three years before attending Montana State University, where he majored in zoology with a minor in chemistry. Issac Newton said of his own career that he "stood on the shoulders of giants," and no less is true of Urey. He developed his mastery of thermodynamics under the influence of G. N. Lewis and his school in Berkeley, where he moved in 1921. Later, in 1923, he went to Copenhagen for a year and studied atomic physics with Niels Bohr. On his return to the US Urey became an instructor at Johns Hopkins and in 1929 moved to Columbia, where he was appointed associate professor of chemistry. While at Columbia he collaborated with A. E. Ruark to write *Atoms, Molecules and Quanta*, one of the earliest books on quantum mechanics. The deep understanding that Urey had acquired of thermodynamics and quantum mechanics, together with his interest in the regularities of nuclear structure and his skills in optical spectroscopy, culminated in his discovery, in 1931, of deuterium.

In the 1930's Urey became the leading authority in the new science of isotope chemistry. His research was partly concerned with the theoretical estimation of the chemical differences between isotopic atoms and molecules and with the chemical methods by which isotopes could be separated. His primary concern, however, was with the information that could be gleaned from the existence of isotopes and the ways in which separated isotopes could be used as tracers of chemical, biologi-



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cal and geological processes.

During the Second World War Urey put his knowledge of isotope chemistry to use in the national effort. As director of the program at Columbia for isotope separation, he, with his team, transformed the laboratory-scale apparatus of the previous decade into the vast industrial-scale plants used for the production of heavy water and for the separation of the uranium isotopes. The chemical and gaseous diffusion processes developed by Urey and his colleagues were an essential component in the success of the Manhattan Project.

After the war Urey accepted an appointment at the University of Chicago and in 1947 published what is probably his most cited paper, "The thermodynamic properties of isotopic substances." This paper laid out much of the underpinning of the infant discipline of isotope geochemistry by extending and expanding his work of the 1930's. In an ingenious application of these theoretical principles Urey used high-precision mass spectrometry to measure the variations in the oxygen isotope abundances within the carbonate shells of belemnites that lived in the Cretaceous ocean. From these