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we hear that

tion Design of the Division of Instructional Research and Service. Other new appointments include **R. Carter Morris** of the University of Virginia and **Fred L. Petrovich** of the University of California, Berkeley, to assistant professor.

The new director of the Institute for Basic Standards of the National Bureau of Standards is **Arthur O. McCoubrey**, a leader in the development and application of frequency and time standards. He was formerly vice-president and director of Frequency & Time Systems, Inc in Danvers, Massachusetts. In announcing the appointment, NBS director Richard W. Roberts said McCoubrey "brings to the Institute . . . a distinguished record in private industry, where he for years has been in the forefront of developments involving precision instruments." McCoubrey holds a PhD in physics from the University of Pittsburgh (1953).



McCOUBREY

Mark Q. Barton, a physicist in the accelerator department at Brookhaven National Laboratory, has been appointed to a three-year term as chairman of the department. Barton succeeds **Ronald**

Rau, associate director for high-energy physics, who has been acting chairman for the past year.

At the Memorial University of Newfoundland in St John's, **Tran Trong Gien** has been promoted to professor of physics.

Rein A. Uritam has been promoted to associate professor in the physics department at Boston College, Chestnut Hill, Massachusetts.

At California State College, Stanislaus (in Turlock, California) **Tai L. Chow** has been appointed chairman of the department of physics and physical sciences.

P. A. M. Dirac, a professor in the physics department at Florida State University, was recently awarded the Order of Merit by Queen Elizabeth II of the UK. The Order of Merit is held by only 24 British subjects at a time.

David S. Potter, the director of research of Detroit Diesel Allison Division of General Motors Corp, is now Assistant Secretary of the Navy for Research and Development. In this capacity Potter will have primary responsibility for policy development and conduct of the Navy's research, development, test and evaluation program.

Formerly with the department of electrical engineering at Texas Tech University, **Larry C. Burton** is now associate research professor at the Institute of Energy Conversion, University of Delaware, Newark.

obituaries

Edward Uhler Condon

The extraordinary career of Edward Uhler Condon, president of the American Physical Society (1946) and of the American Association of Physics Teachers (1964), ended with his death in Boulder, Colorado, on 26 March 1974.

Born in Alamogordo, New Mexico, on 2 March 1902, Edward Condon was one of the young Americans who made the pilgrimage in 1926 to Göttingen and Munich and grasped immediately the significance and power of the new quantum theory. As an undergraduate, Condon had worked as a reporter for the *Oakland Inquirer*, thinking he might pursue a career in journalism. But the intellectual challenge of physics, after a brief flirtation with chemistry, caught his fancy. When he returned from Göttingen, he worked

briefly as a public-relations man for Bell Labs, lectured at Columbia and then embarked on an academic career that took him to Princeton, Minnesota, and back to Princeton, where he taught until 1937.

Like most great scientists, Condon made important contributions while still a student. The basis for his papers on the separability of electronic and vibrational motions in molecules (the Franck-Condon Principle) was in his Berkeley thesis. With R. W. Gurney, he was an early explorer of quantum-mechanical tunneling, applied to the phenomenon of alpha-particle radioactivity. In 1937, with Gregory Breit and Richard Present, he interpreted proton-proton scattering data and established the importance of charge independence in the strong nuclear interaction. His early solid-state theory work was the explanation of op-

tical rotatory power, and later he studied semiconductor-contact potentials.

With Philip M. Morse he wrote the first English-language text on quantum mechanics (1929). With G. H. Shoreley he wrote the *Theory of Atomic Spectra* (1936), still the primary treatise in the field. In later years the *Handbook of Physics*, which he edited with Hugh Odishaw, and his editorship of *Reviews of Modern Physics* demonstrated once again his facility for dealing with the full range of topics in physics.

These brief notes are an inadequate tribute to the side of Ed Condon's career that will have the most lasting value—his great contributions to knowledge through discoveries in physics. This side of his career is much more fully documented in *Topics in Modern Physics: A Tribute to Edward U. Condon* by Wesley Brittin and Halis Odabasi (Colorado Associated UP, 1971). Younger physicists who may wish to emulate Condon's courageous public record as an outspoken defender of truth, civil liberties and peace may lose sight of the monumental research contributions that won him the admiration of his fellow scientists and the respect of the public, which permitted him to make a major impact on public affairs.

The second phase of Condon's career began with his move to Westinghouse as associate director of research, just two years before the beginning of World War II in Europe. He brought Westinghouse into the nuclear age and earned an accolade from *Time* as "king of the atomic world." He served on the National Defense Research Committee during World War II, but was not present at his birthplace in Alamogordo when the Trinity explosion gave that small New Mexico town its second claim to fame.

With the war over, Condon became director of the National Bureau of Standards and, concurrently, science advisor to Senator Brian McMahon, chairman of the special Senate committee on atomic energy. McMahon was leading the forces for civilian control of the nuclear-weapons program and with Condon's active help saw success in the McMahon-Douglas bill, passed in August 1946. Condon believed deeply that civilian control over nuclear-weapons development and production was essential to avoidance of nuclear war. In the year of Condon's death, this issue may be reopened as Congress considers the Energy Research and Development Administration proposal which restructures the AEC.

At NBS, as he had at Westinghouse, Condon concentrated his attention on good science, stripping away administrative encrustations of the past, hiring

the next generation of scientific leadership, pulling together programs (like building technology) of great potential benefit to the public. He built the NBS Boulder Laboratories. But soon these accomplishments were dwarfed in the public eye by the relentless attacks of Congressman J. Parnell Thomas and the House Un-American Activities Committee, which Thomas headed. The press picked up the phrase in a HUAC report (published on Condon's birthday in 1948) that stated, "It appears that Dr Condon is one of the weakest links in our atomic security." Privately, Condon described the impossibility of refuting such a charge with characteristically colorful language: "If you say I've got a wart on my nose, I can deny it. But if you just say I'm one of the ugliest men in town, all I can do is argue that I'm really quite pretty." Time and again, his security clearance status was reviewed

HEKA



CONDON

and re-established, only to be challenged again. Finally, in 1951, with his record cleared and with Parnell Thomas in Danbury Prison, convicted of taking kickbacks from his office staff, Condon left government to become head of research and development for the Corning Glass Works.

In October 1954, Condon's Navy clearance was again re-established in connection with government contract research at Corning. When the clearance was dramatically suspended by intervention of the Secretary of the Navy, the press reported that Vice President Nixon, a former member of HUAC, implied in campaign speeches that he had requested the suspension.

Ten years later, after Condon had taught at Oberlin two years and at Washington University for seven, he moved to Boulder, Colorado, as professor of physics and fellow of the Joint Institute for Laboratory Astrophysics.



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obituaries

His security clearance was quietly restored, clearing his record once again.

What kind of man was he? Grace Marmor Spruch's profile in *Saturday Review* (1 February 1969) says it well: "The composite Condon is a moral, impassioned man, with a depth of concern for mankind not common in scientists; a man fiercely principled and anti-diplomatic; a man who believes and feels in sharp contrasts, who will let the world know his position without ambiguity. Fuzzimindedness is an anathema to him and he insists on saying so at every opportunity. But this rasping trait is wedded to an extreme generosity and kindness. Throughout his life he has given freely of his time, his counsel, his finances, and his home."

Watergate came as no surprise to Edward Condon, nor did its aftermath. I imagine he would like to have lived to see the outcome of the impeachment inquiry. But Condon understood and paid his share of the price of liberty. Somehow his idealism, his sense of humor and his inexhaustible energy made his relentless quest for a better world look like optimism. He was elected president of the American Association for the Advancement of Science during the height of his troubles with HUAC. He was president of the Society for Social Responsibility in Science (1968-69) and co-chairman of the National Committee for a Sane Nuclear Policy (1970). He was appropriately honored on his retirement from JILA and the University of Colorado in the summer of 1970 by the volume edited by Brittin and Odabasi mentioned earlier. Brittin relates a comment about Condon by E. Bright Wilson: "Sometimes I think he looks for trouble," Wilson said. Condon's comment: "It's not hard to find."

Sadly, brilliant scientists—who serve their country and principles, their love of truth and their fellow citizens with relentless determination and delightful good humor—are hard to find indeed.

LEWIS M. BRANSCOMB

Vice-president and chief scientist
International Business Machines Corp
Armonk, New York

Fritz Zwicky

Fritz Zwicky, emeritus professor of astrophysics at the California Institute of Technology, died on 8 February.

Born in Bulgaria in 1898, Zwicky was a Swiss citizen and received his PhD from the Federal Institute of Technology in Zurich in 1922. Trained in the European tradition of physicists and

chemists, he was a student of Paul Scherrer, who in turn had worked with Peter Debye. He was a contemporary of Wolfgang Pauli and friends with Herman Weyl, both when the latter was in Princeton and in Europe.

Zwicky came to Cal Tech in 1925 and was made assistant professor of theoretical physics in 1927. His original field was crystallography, but while in Pasadena his interests expanded into many other fields, such as mechanics and astronomy. From 1943 to 1945 he was research director for the Aerojet Corporation. During these years he worked on and invented rocket and propulsion engines using morphological principles—a lifelong interest that led to his writing a book on morphology and becoming president of the Morphological Society in 1961. He received the Medal of Freedom for services to the US Government in 1949.

FLOYD CLARK



ZWICKY

Later he became a vice-president of the International Academy of Astronautics.

Zwicky became professor of astrophysics at Cal Tech in 1942, and as Palomar Mountain began to be developed into an observing site he initiated the installation of the fast, wide-field, 18-inch Schmidt telescope. With this telescope he pioneered in the systematic search and discovery of supernovae in external galaxies. Even by the time of his death he had still personally discovered more supernovae than all the rest of supernovae searchers combined. His research papers on supernovae, some done with Walter Baade, led him to his most noteworthy achievement, namely the prediction of the existence of neutron stars. The theory of neutron stars was later mathematically developed by J. Robert Oppenheimer and George M. Volkoff, and recently has been substantiated by the discovery of pulsars.