

Retirements 1986

**Francis S.
Buffington**



FRANCIS S. BUFFINGTON was educated at MIT, where he received an SB in general engineering in 1938 and a ScD in metallurgy in 1951. His research interests lie in the areas of diffusion and phase transformations in solids.

Buffington came to Caltech in 1951 as an assistant professor of mechanical engineering. He was promoted to associate professor in 1956, and in 1963 his title was changed to associate professor of materials science. In 1983 he was made professor of materials science. He is a registered professional engineer and a member of the American Physical Society and the American Society for Metals.

Buffington has served on the Graduate Studies Committee, on the Membership and Bylaws Committee, and on the Faculty Board. He was chairman of the Curriculum Committee in 1980-1981. The bulk of his service, however, has come about in the following five roles: associate dean of graduate studies; option representative for applied mechanics, civil engineering, engineering science, environmental engineering science, materials science, and mechanical engineering; secretary of the combined faculties in applied mechanics, materials science, and mechanical engineering; and chairman of the committee to monitor first-year PhD students in applied mechanics, civil engineering, materials science, and mechanical engineering.

Buffington's colleagues in the Division of Engineering and Applied Science remark on his ability to recall instantly the special aspects of the academic life of any individual student under discussion. His talents as option representative have proven so valuable that he has been asked to continue in this capacity for several engineering options during the coming year.

Robert F. Christy

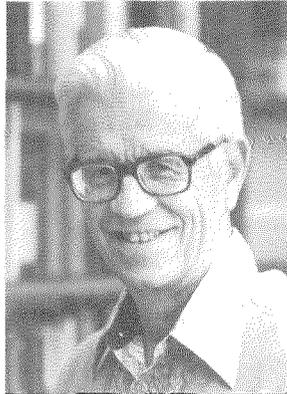


ROBERT F. CHRISTY came to Caltech in 1946, soon after the completion of his work on the Manhattan Project. Charlie Lauritsen and Willy Fowler had been looking for a theoretical physicist for their experimental nuclear physics group, and they asked J. Robert Oppenheimer for a recommendation. He promptly suggested his former student Christy, then on the University of Chicago faculty, calling him "one of the best in the world."

When Christy got here, he immediately gained renown for his theoretical work, but he was also known for his ability to do experimental work and to work with his hands. As one of the members of that old group said, "I wouldn't give most theoretical physicists a paper clip because they'd hurt themselves. But Christy's amazing. He's even built a swimming pool. And he can do all kinds of complicated work around his house — not as a hobby, mind you, but as a challenge. If something breaks down, he'd rather fix it than have to say he can't."

In the early 1960s Christy's interests turned to theoretical astrophysics, and he won the prestigious Eddington Medal of the Royal Astronomical Society of London for his work on variable stars. He is a member of the National Academy of Sciences, and he has served Caltech as executive officer for physics (1968-1970), vice president and provost (1970-1980), and as acting president of the Institute (1977-1978). In 1983 Christy was named Institute Professor of Theoretical Physics by the Board of Trustees.

J. Kent Clark

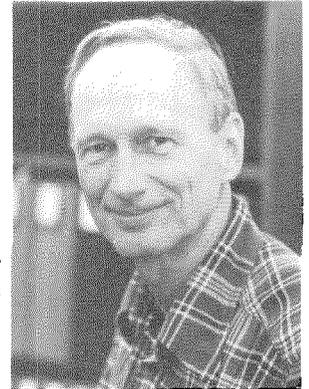


HE'S BEEN CALLED Caltech's unofficial poet laureate and the Bard of Baxter Hall. J. Kent Clark, professor of literature, has for years been best known around campus for writing, acting, and singing numerous Caltech musicals. These have included "The Road to Stockholm" (1954), "This is Science?" (1955), "Who is this Guy DuBridge?" (1956), "The Importance of Being Earnest" (1959), "What Makes Beadle Run?" (1961), "Lee and Sympathy" (1966), "The Bacher File" (1970), and "Beautiful Beckman" (1975). (Clark's musical collaborator has been Elliot Davis, whom Clark describes as a lawyer, business executive, and part-time genius.)

In between musicals Clark has served on many faculty committees and has written three books: *The King's Agent* (1958), a novel; *Dimensions in Drama* (1964); and *Goodwin Wharton* (1985). This last is a delightful biography of a late-17th-century Englishman, Lord of the Admiralty under King William, who must have been the most gullible human being who ever lived.

Clark was born in northern Utah and received his BA from Brigham Young University, majoring in English and history. His graduate work at Stanford University was interrupted by World War II. He served three and a half years in the Air Force as a supply officer in a radar battalion in the Philippines. Shortly after coming to Caltech, Clark completed his dissertation — on Jonathan Swift — at the Huntington Library. He started as an instructor in English in 1947, and was appointed assistant professor in 1950, associate professor in 1954, professor in 1960, and professor of literature in 1980.

Eugene W. Cowan

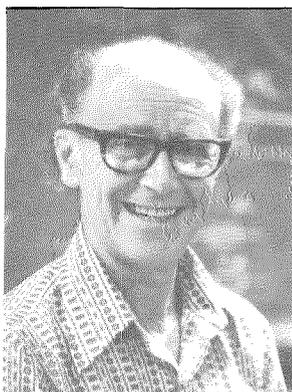


EUGENE W. (BUD) COWAN has been at Caltech for over 40 years. After receiving his BS at the University of Missouri and his MS at MIT, he came to Caltech in 1945. He worked with Carl Anderson (now professor of physics, emeritus), and was awarded his PhD in 1948. He became a research fellow in 1948, an assistant professor in 1950, and an associate professor in 1954. In 1961 he was promoted to professor of physics, the position he has held ever since.

Cowan's research interests have included investigations of high-energy interactions of cosmic rays, air pollution studies, and studies of the earth's magnetism. He is noted for perfecting a cloud chamber capable of operating on a continuous basis. All cloud chambers depend on the condensation of a vapor on the charged ions left by the passage of a speeding particle. Previous cloud chambers required a sudden, large drop in chamber pressure for condensation to occur, and this had to be followed by a rest period during which no observations could be made. Cowan's innovation eliminated the need for the pressure decrease and thus eliminated the rest period.

Long recognized for the quality of his teaching, Cowan was awarded the ASCIT award for teaching excellence this past February for his course on classical electromagnetism. He has been a regular patron of the Caltech pool's noontime lap swim for years, a practice he plans to continue.

**Norman
Davidson**



LIKE LINUS PAULING and Max Delbrück, Norman Davidson belongs to the tradition of physical scientists who have turned their attention to biology. He started out working on the kinetics of fast reactions and for this he was elected to the National Academy of Sciences, and he also received the California Section Award of the American Chemical Society in 1954. But his interests soon turned to molecular biology and the structure and function of DNA.

The California State Museum of Science and Industry described his more recent research when they named him California Scientist of the Year for 1980: "Dr. Davidson has pioneered the development of methods, using the electron microscope, for identifying structures and mapping sequences in nucleic acids. One such method, heteroduplex mapping, is used by virtually every laboratory in the world interested in gene structure. The Davidson laboratory has applied these and other methods in an elegant series of studies of the genes of tumor viruses and the fruit fly."

Davidson received his BS and PhD in chemistry from the University of Chicago. In addition, Oxford University awarded him a BSc when he was there on a Rhodes Scholarship in 1939. During World War II he worked on war-related subjects at USC, Columbia University, and the University of Chicago. In 1946 he came to Caltech as an instructor in chemistry and he was associated with Linus Pauling in the teaching of the freshman chemistry course. He became assistant professor in 1949, associate professor in 1952, and professor in 1957, and in 1982 he was named the Norman Chandler Professor of Chemical Biology. He was executive officer for chemistry from 1967 to 1973.

**Charles R.
De Prima**

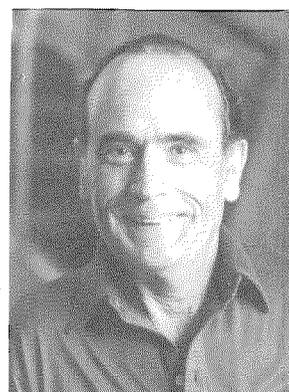


CHARLES R. DE PRIMA is one of those rare Caltech professors who started his career in one division and is finishing it in another. He was hired as an assistant professor of applied mechanics in 1946 by what was then called the Division of Civil and Mechanical Engineering and Aeronautics (now the Division of Engineering and Applied Science). His area of research was fluid mechanics, and he taught the course in mathematics for engineers originated by Theodore von Kármán. In 1951 he was promoted to associate professor, and he became a full professor in 1956.

But there was a reorganization of responsibilities among the divisions in the early 1960s, and, in addition, De Prima's interests had shifted in the direction of pure mathematics. So in 1964 he became professor of mathematics in the *Division of Physics, Mathematics, and Astronomy*. His research in recent years has been in the areas of analysis, partial differential equations, and operator theory — the study of abstract spaces and the operators that work on those spaces.

Retirement hasn't stopped his research; only the setting has changed. De Prima has moved to Gualala, California, an isolated community on the Pacific coast in Mendocino County, 120 miles north of San Francisco. He's in good company: several current and former members of the Caltech community have homes there, including David Morrisroe (vice president for business and finance and treasurer) and Clair Patterson (senior research associate in geochemistry).

**David C.
Elliot**



DAVID C. ELLIOT seems to have spent the early part of his academic career collecting master's degrees — he's got three of them. The first came in 1939 from St. Andrews University in his native Scotland. After a few years in the Indian Civil Service during and after World War II, he went to Harvard University, where he obtained a second master's in 1948 and a PhD in 1951. Five years later he received his third master's, this one from Oxford University.

Elliot came to Caltech as an assistant professor of history in 1950. In 1953 he was promoted to associate professor, and he became professor of history in 1960. His research interests have ranged widely: he has studied European organizations, the liberal party in Scotland, London's 1660 Restoration period, and arms control and national defense. He has served as a consultant to the Ford Foundation, the RAND Corporation, NASA, and the Foreign Area Fellowship Program. In 1980 he was awarded a NATO fellowship for a project on European moves for arms control dealing with theater nuclear forces.

Elliot's career has been marked by dedicated service to the Caltech community. He was chairman of the special 75th anniversary celebrations in 1966 and served as vice chairman of the faculty from 1965 to 1967. From 1967 to 1971 he was executive officer for the humanities and social sciences, and from 1973 to 1985 he was secretary of the faculty. His class "Introduction to Europe" has long been popular with Caltech undergraduates, and in 1971 Elliot received an ASCIT award for teaching excellence.



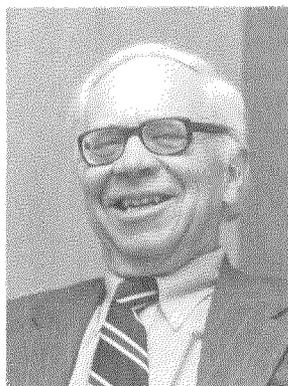
Derek Fender

DURING WORLD WAR II Derek Fender, like so many other British scientists of the period, served in the Royal Corps of Signals, helping to develop radar. The aspect of the problem he worked on involved the interface between man and machine. How, for example, can a gunner be trained to aim not at the point where an enemy aircraft is now, but where it will be in 30 seconds, the time it will take the anti-aircraft shell to arrive?

Fender's research since then has continued more or less in the same vein. He has always been concerned with questions about how human brains interpret signals coming from the world around us. To get at some of these questions, he has had to invent some rather elaborate devices. He's pictured on the cover of the April 1971 issue of *E&S* wearing one of these devices — a custom-fitted, air-conditioned helmet bristling with 49 electrodes that he employed to record his own brain waves. Later, he improved the device to the point where it contained 97 electrodes.

Using these devices, and others as well, he studied subjects such as how the brain interprets textures and localizes objects in space. Fender is also credited with a significant advance in the development of the electroretinogram, an advance that permitted the early detection of retinal disease.

Fender came to Caltech from Reading University in 1961. He started out as a senior research fellow in engineering, and was appointed associate professor of biology and electrical engineering in 1962. In 1966 he became professor of biology and applied science.



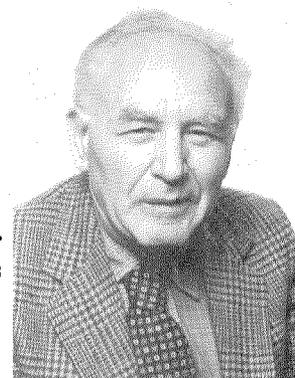
W. T. Jones

IT WAS ONLY IN 1970, after a long and distinguished career at Pomona College, that W. T. Jones came to Caltech, at first as a visiting professor of philosophy. He decided to stay, and he was appointed Andrew W. Mellon Professor for the year 1972-1973, after which he became professor of philosophy.

Jones's special subject of study has been in the area of world views, and he has published many papers on aspects of this subject. He has also written seven books, including *Morality and Freedom in the Philosophy of Kant* (1940), *Facts and Values* (1961), *The Sciences and the Humanities* (1965), and the five-volume *A History of Western Philosophy* (1969-1975).

Jones has received many honors, and has been, at various times, a Rhodes Scholar, a Guggenheim Fellow, a Lippincott Fellow, a Proctor Fellow, a Ford Faculty Fellow, and a Phi Beta Kappa Visiting Scholar. He is the director of the Wenner-Gren Foundation of Anthropological Research and a member of the Board of Trustees of Pomona College. He has earned honorary doctorates from Ripon College and Pomona College.

In a stimulating article entitled "What's the Use of the Humanities" in the January-February 1977 issue of *E&S*, Jones wrote, "[O]ne of the great aims of education should be to help students learn how to enjoy — enjoy, not merely tolerate — cognitive dissonance, cognitive ambiguity. . . . We want an educational system that does not allow its graduates to live within their various competences as in a castle, protected by moat and drawbridge, but one that encourages them to look outside, even on occasion to step outside and view their castle from without."



Lester Lees

LESTER LEES received his bachelor's and master's degrees from MIT, but throughout his long career he never had time to acquire a PhD. But there's a saying in the aeronautics community that goes "One Lees equals ten PhDs," so the lack of a doctorate has apparently been no handicap.

Lees started at Caltech in 1942 as a research fellow and instructor in mathematics. He spent the years from 1946 to 1953 on the faculty of Princeton University, but then returned to Caltech to become associate professor of aeronautics. He was named professor of aeronautics in 1955 and professor of environmental engineering and aeronautics in 1970. In 1971 he was appointed the first director of the Environmental Quality Laboratory, a position he held until 1974.

Lees's research interests have centered on the problems of high-speed flight, including the re-entry of missiles and spacecraft into the earth's atmosphere. Within this area, one of his special research topics involved studies of atmospheric wakes behind re-entry vehicles. Because of his expertise in this area, he was asked to serve on the Space Vehicle Panel, the Space Technology Panel, and the Combined Space Science and Space Technology panels of the President's Science Advisory Committee from 1963 to 1967. He was also a member of NASA's Lunar and Planetary Missions Advisory Board from 1967 to 1969.

Lees's work in aircraft fuel-efficiency led to his interests in issues of environmental quality. He has been the recipient of many honors and awards, including election to the American Academy of Arts and Sciences and the National Academy of Engineering.



**Sten
Samson**

A SWEDISH CITIZEN, Sten Samson has received three degrees from the University of Stockholm: Fil.kand. (1953), Fil.lic.(1957), and Fil.dr.(1968). He first came to Caltech in 1953 at the invitation of Linus Pauling, then chairman of the chemistry division. Except for a brief return to Sweden in 1956-1957 for the purpose of applying for immigrant status, he has been here ever since.

Samson's research interests have focused on the crystal chemistry of highly complex intermetallic compounds, complex minerals, and solid-state related substances of inorganic nature. He has been active in the development of a broad line of x-ray instrumentation, including automated diffractometers, monochromators, and low-temperature devices and, in fact, he was manager of the chemistry division's x-ray diffraction facility in Crellin Laboratory.

Samson is currently trying to discover in detail the processes that occur in the crystal lattice of organic conductors at low temperatures. Samson developed an automated diffractometer for this purpose capable of measuring x-ray reflections down to 16 K. An understanding of these processes is crucial in elucidating mechanisms of solid-state transitions such as conductor-to-insulator and paraelectric-to-ferroelectric.

Samson started at Caltech as a research fellow. He was promoted to senior research fellow in 1961, to research associate in 1973, and to senior research associate in 1980.



**Walter
Schroeder**

WALTER SCHROEDER came to Caltech as a PhD candidate after receiving his bachelor's and master's degrees at the University of Nebraska. He worked in the lab of Laszlo Zechmeister trying to determine the chemical structure of carotenoids. He received his doctorate in 1943 and quickly found himself aiding the war effort — he was a member of a group investigating the chemistry of smokeless powder and other explosives.

After the war Schroeder's interests turned to the biochemistry of proteins and, in particular, their structure and amino acid sequences. In 1969, using techniques far more tedious and cumbersome than those available today, he accomplished the feat of sequencing the enzyme catalase. With a length of 506 amino acids, it was by far the largest protein sequenced up to that time.

Schroeder has spent most of his career investigating one particular group of proteins — the hemoglobins — which are the oxygen-carrying molecules in blood. He is known for determining the amino acid sequence of fetal hemoglobin and detailing the differences between that molecule and the type of hemoglobin present in adults. Lately, he has begun investigations of sickle-cell anemia, a disease that results when a person has a defective gene for adult hemoglobin. Along with others, he believes that the disease may be ameliorated if a sickle-cell victim's blood cells can be tricked into resuming production of fetal hemoglobin.

Schroeder was a research fellow from 1943 to 1946, a senior research fellow from 1946 to 1956, a research associate from 1956 to 1981, and a senior research associate in chemistry from 1981 until he attained emeritus status this year.

AT THIS YEAR'S faculty dinner at the Athenaeum honoring the 1986 retirees, Kent Clark led the assembled dignitaries in a rousing rendition of one of his songs, written originally for the 1953 show "Take Your Medicine." The noble sentiments expressed in the chorus might well serve as a motto for us all:

*Let's grow old disgracefully
I'll chase you and you chase me
What a scandal we can be
As we grow old disgracefully.*