kind as just another animal may be necessary, it is surely not sufficient for understanding what is essentially human. Similarly, bracketing out the scientific "facts of the matter" may keep science studies from ever finding out all that much about science. (It is ironic that, after repeated SSK assertions that science has no unique essence, Harry Collins refers us to "the kind of assiduous study done in the field or in laboratories," to distinguish science from, for example, creationism. Collins, I'm sure, didn't intend trying to define science, but what he says does bring to mind the definition G. G. Simpson offered nearly half a century ago: "Science is an exploration of the material universe that seeks natural, orderly relationships among observed phenomena and that is self-testing.")

I've said little about the contributions by Labinger, Sokal, and the other scientists, mainly because their essays are so clearly thought out and written. Reading the book is a bit like riding a boat on a choppy sea: a rise into clarity followed by a plunge into obscurity. Not uniformly, of course. Interestingly, the scientists most opposed to the methodology of SSK seemed the clearest; the scientists with some sympathy for SSK somewhat less so; and the majority of SSKers and allies less so yet, with Peter Dear's offering re "epistemography" particularly difficult going, encompassing a turgidity and hair-splitting worthy of a medieval theologian.

The book is well indexed, and the editors have usefully provided bracketed numbers when important topics are introduced, referring the reader to other chapters where the same topics are discussed by other contributors with differing viewpoints.

I hope *The One Culture?* finds an audience, especially among scientists, who—as this book makes clear—are being studied by a group that claims for itself an objectivity it would deny to those it studies. I think the public at large could find it interesting, perhaps even helpful, as well. I did. —*MF*

The 16th annual meeting of the Society for Literature and Science, which seeks to strengthen bridges between the two fields, will be held October 10–13, 2002, in Pasadena, with support from Caltech and the Huntington Library. Proposals for panels and papers are due June 1. For more information, see the conference Web site at http://SLS-2002.caltech.edu/ or contact Jay Labinger, jal@its.caltech.edu. □

Lyman G. Bonner
1912 – 2002

Lyman Bonner, who served Caltech in a number of administrative positions between 1965 and 1989, died in Pasadena on March 22 at the age of 89.

Bonner was born in Kingston, Ontario, on September 16, 1912, the second of seven children. His first encounter with Caltech came in 1929 as a 17-year-old transfer sophomore, while his father, head of the chemistry department at the University of Utah, was on sabbatical here. Bonner finished his degree at Utah in 1932 and followed his older brother James back to Caltech as a graduate student. He earned his PhD in chemistry in 1935, the second of four Bonner brothers to hold Caltech doctorates.

His dissertation work on molecular structure led to an interest in infrared spectroscopy, which at Princeton, where he went next as a National Research Council fellow, had its home in the physics department. It was there that, as Bonner says in his 1989 oral history, "I decided I enjoyed physics and physicists more than I enjoyed chemistry and chemists, and I quietly made a switch." In 1937, he became an instructor and then assistant professor of physics at Duke, where he taught young naval officers in the wartime V-12 program.

When that program began to phase down in 1944, Bon-

ner took a leave of absence for more hands-on war work and joined the Allegany Ballistics Laboratory, which was developing solid rocket propellants for the Navy under the Office of Scientific Research and Development. When ABL reverted to civilian life after the war and was taken over by Hercules, Inc., Bonner resigned his position at Duke and stayed on as technical director. In 1953 he was awarded the Navy's highest civilian honor, the Distinguished Public Service Award, and from 1955 to 1965 was director of development in the explosives and chemical propulsion department at Hercules.

By 1965, Bonner had become itchy to change directions, away from industry and government. On inquiring what might be available at Caltech (brother James was professor of biology here), he was offered the new post of director of foundation relations. A new fundraising campaign was about to begin. "After thinking it over for a day or two, it seemed to me very much the sort of thing I would like to try," he said later. "It was an entering step in the administration, a chance to learn what the administrative roles of a university were. On that basis I was glad to take it, at a 40 percent cut in salary, but I'd expected at least that. It wasn't money I was looking for, but a little more satisfaction. And I've never regretted it."

Because the campaign intended to raise money for 30 new buildings (that didn't quite happen), Bonner became interested in what the buildings were to be like—how big, how much they would cost, what they were to do. So in 1967 he found himself with a new job: assistant to the president (Lee DuBridge) for facilities planning. He was also named an associate in chemistry, but again gravitated toward physics instead; he taught recitation sections of freshman and sophomore physics for many years.

In late 1968, Bonner tried on yet another hat, that of director of student relations, another new position created by DuBridge, with responsibility for "maintaining and promoting good communications and good relations among students, faculty, administration and trustees." As such, he presided over the admission of female undergraduates, as well as the not-very-turbulent times of student "unrest" at Caltech. The campus was fully mobilized for an invasion of the Students for a Democratic Society in 1969, but only about 35 people showed up, Bonner said in his oral history. Always rather laid-back himself, he thought the campus had overreacted. "We have more problems finding activists than having too many activists," he wrote to then-president Harold Brown.

The closest thing to violent activism that Bonner remembered occurred after the Kent State shootings in 1970, when the administration refused to lower the flag to half mast. Students broke the lock and lowered the flag anyway. Then, he said, we sat around in the Winnett clubroom and talked about it.

"Lyman was a lovable chemist—a contradiction in terms," said J. Kent Clark, professor of literature, emeritus. "He was Caltech's chief troubleshooter and problem solver, and he was not afraid of change. His versatility and his amiability helped Caltech make some very interesting transitions. He did Caltech a tremendous amount of good."

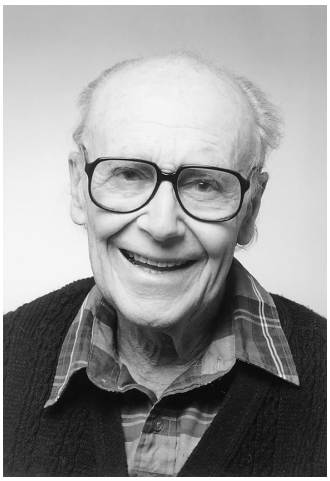
Bonner liked dealing with the students and remained director of student relations until 1980, when his title was changed to administrator for student affairs, a post he held until 1984. He was principally responsible for establishing the Student Health Center as it exists today. In addition he took on the post of registrar from 1977 till 1989, when he retired.

He loved words ("Lyman was also a literate chemist," said Clark) and was still solving crossword puzzles long after his Alzheimer's disease was diagnosed.

Bonner is survived by his wife, Jackie Bonner of Pasadena, who joined *Engineering & Science* magazine in 1967 and was its editor from 1979 to 1984; a daughter, Lynn E. Bonner of Seattle; two sons, Allen G. Bonner of Philadelphia and Philip H. Bonner of Lexington, Kentucky; five grandchildren; and four great-grandchildren. □ —*JD*

When the area between Thomas and Guggenheim was marked off for relandscaping in 1974, students parked their cars (with "for sale" signs on them) there as a prank in honor of Bonner (right), who was then director of student relations. The campus police were not amused and ticketed all the cars.

Norman R. Davidson
1916 – 2002



1955

Norman Davidson, whose groundbreaking work in molecular biology led to a better understanding of the genetic blueprint of life, died February 14 in Pasadena, after a brief illness. He was 85.

Davidson was the Norman Chandler Professor of Chemical Biology, Emeritus, at Caltech, where he had been a faculty member since 1946. He took emeritus status in 1986, but served as executive officer for biology from 1989 to 1997 and remained active in research until his death.

"It was with the deepest personal regret that I heard of the death of Norman Davidson," said Caltech president David Baltimore. "Norman was a friend long before the prospect of my being president of Caltech arose, and he symbolized for me the essence of the Institute.

"His movement into biology from a background in chemistry allowed him to play a special role in the development of molecular biology. He saw imaginative ways that structural understanding could illuminate functional questions. He trained some of the finest and most imaginative people in the field. And he was deeply loved by all with whom he came in contact because of his unalloyed commitment to pushing the frontiers of understanding.

"Caltech is diminished by the loss of this great man who, undaunted by infirmity, almost to the end drove himself around the campus in his cart, asking questions, making suggestions, and still fully contributing to the institution to which he had given so much of his life," Baltimore said.

Davidson was born April 5, 1916, in Chicago. He earned a bachelor's degree in chemistry at the University of Chicago in 1937, and completed another bachelor of science degree at the University of Oxford in 1938 as a Rhodes Scholar. In 1941 he completed his doctorate in chemistry at the University of Chicago.

During the war he worked at USC for the National Defense Research Committee, and at both Columbia University and the University of Chicago for the Division of War Research. From 1943 to 1945, he worked in the University of Chicago's metallurgical laboratory on the plutonium separation project for the Manhattan Project.

After the war and a brief stint as a researcher at the Radio Corporation of America, Davidson joined the Caltech faculty as a chemistry instructor and remained on the faculty for the rest of his life. He became a tenured professor of chemistry in 1952, a full professor in 1957, executive officer for chemistry in 1967, and the Norman Chandler Professor of Chemical Biology in 1982. He also served briefly as interim chair of the Division of Biology in 1989.

Davidson was known in the scientific community particularly for his innovative methods in bridging the gap between the physical and biological sciences. He pioneered new methods in physical chemistry and electron microscopy, the latter proving especially useful for genetic mapping and exploring the information properties of DNA and RNA.

On the reaction to his move from physical chemistry into molecular biology, Davidson said in his 1987 oral history: "I can recall a number of questions about how I was going to do it. But the important point is that Caltech is an environment that understands and appreciates interdisciplinary science. Even people who don't know anything about it appreciate people moving into new and exciting areas."

In 1996, when he was awarded the National Medal of Science by President Clinton, Davidson was working on new methods for studying electrical signaling in the nervous system and the ways in which the system changes during learning and memory formation. He was cited by the White House "for breakthroughs in chemistry and biology which have led to the earliest understanding of the overall structure of genomes."

"For example," the White House statement continued, "Davidson's research on DNA established the principle of nucleic acid renaturation, one of the most important principles in molecular biology and a primary tool for deciphering the structure and function of genes."

Davidson was also a founding member of the advisory council to the Human Genome Project.

"Norman was a major figure in both chemistry and biology for more than half a century, and one of the people who helped bring the two together, not just at Caltech, but in the subject as a whole," said Caltech provost Steve Koonin.

Henry Lester, the Bren Professor of Biology, noted the importance of Davidson's work in neuroscience since the late 1970s. "Norman made contributions in several important fields," said Lester, who began working with him in 1983 and shared laboratory space with him until Davidson's death. "His laboratory helped define the molecular biology of membrane excitability, including ion channels, transporters, and receptors."

Davidson's many awards included his designation as the 1980 California Scientist of the Year, the Robert A. Welch Award in Chemistry (1989), the Dickson Prize for Science (1985), and the Peter Debye Award by the American Chemical Society (1971). He was a member of the National Academy of Sciences for 42 years, a fellow of the American Academy of Arts and Sciences since 1984, and holder of an honorary doctorate from the University of Chicago.

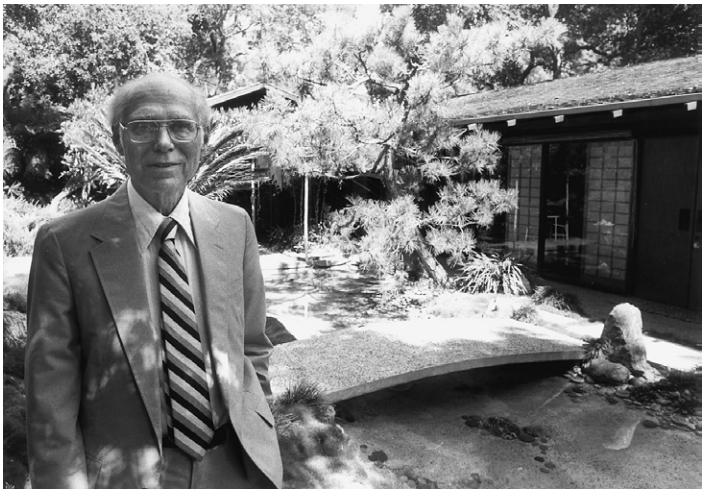
Davidson is survived by his wife, Annemarie Davidson, of Sierra Madre, California; four children, Terry Davidson of Poway, California, Laureen Agee of Mammoth Lakes, California, Jeff Davidson of Cayucos, California, and Brian Davidson of Walnut Creek, California; and eight grandchildren. □ —*RT*

John R. Pierce
1910 – 2002

John R. Pierce, pioneer of satellite communication, science fiction writer, and musician, died April 2 in Sunnyvale, California. He was 92.

Born in Des Moines, Iowa, in 1910, Pierce later moved with his family to California and graduated from Woodrow Wilson High School in Long Beach. He earned three degrees from Caltech: his BS in 1933, MS in 1934, and PhD in 1936, all in electrical engineering. He started off planning to be a chemical engineer, but freshman chemistry, he said in a 1981 profile in *E&S*, cured him of that. A language requirement dissuaded him from physics. He had built and flown his own glider in high school and was briefly attracted to aeronautical engineering, but "we drew endless beams with rivets. So I looked for some sort of engineering that wasn't full of rivets. I became an electrical engineer." Much later he reflected that perhaps what he did was really physics after all.

He began his first career in 1936 at Bell Telephone Laboratories in Murray Hill, New Jersey, eventually to become executive director of research, Communications Sciences Division, in charge of work on mathematics and statistics, speech and hearing, behavioral science, electronics, radio, and guided waves. He was first put to work on vacuum tubes; he claimed to know nothing about them when he started but went on to invent a vacuum tube used in radar during the war and headed a team that developed traveling-wave tubes for amplifying microwaves. Pierce also coined the name "transistor" at the request of his friend Walter Brattain, one of three men who won the Nobel Prize for its invention.



Pierce stands in front of his Japanese-style home in Pasadena in 1981. He had been fascinated with all things Japanese ever since Professor of English Harvey Eagleson suggested, in 1928, that he read *The Tale of Genji.*

Pierce is best known as the father of satellite communication. His ideas, inspired by a 1945 proposal of science fiction writer Arthur C. Clarke, led to the launch, in 1960, of Echo 1, a mylar balloon that bounced radio waves back to Earth. Pierce told the *New York Times* that he felt he had done "something of practical value." Telstar, a direct product of his work, transmitted the first transatlantic television broadcast two years later.

As "J. J. Coupling," Pierce wrote science fiction stories, the first in Hugo Gernsback's *Science Wonder Stories* in 1930. Many of his stories appeared in *Astounding Science Fiction*, and it was this magazine that carried his 1952 story "Don't Write: Telegraph!" which foreshadowed his satellite communication work. The pen name comes from atomic physics; "I didn't know what it meant when I chose it, and I'm a little uncertain now," he said in 1981. He took it from the letterhead of William Shockley's mock

Institute for Useless Research; the "institute's" president was Isaac Neutron and the secretary was J. J. Coupling.

From the '60s on, Caltech tried to lure Pierce back to campus. Finally, Francis Clauser, chairman of the Division of Engineering and Applied Science, was shocked one day in 1971 to get a phone call from Pierce announcing, "You know, I think I'd like to come to California." So, after more than 35 years at Bell Labs, Pierce embarked on his second career as professor of engineering at Caltech. He took emeritus status in 1980 but continued in the post of chief technologist at JPL until 1982.

In that year, at the age of 72, Pierce began a third career as visiting professor of music at Stanford's Center for Computer Research in Music and Acoustics, a post he held for the next 12 years. Although he claimed not to be able to carry a tune, he had become interested in music while at Bell Labs. He composed some of the first computer-synthesized music, made two recordings, and wrote several books on music, sound, and speech and hearing, including *The Science of Musical Sound*.

Pierce was awarded the National Medal of Science in 1963 for his work on communication satellites, and the prestigious Charles Stark Draper Prize in 1995. He received one of Caltech's first Distinguished Alumni Awards (1966) and many other honors, including the Engineer of the Year award of the Institute for the Advancement of Engineering, the Medal of Honor of the Institute of Electrical and Electronics Engineers, the Marconi Award, and numerous honorary degrees. He was a fellow of the National Academies of Sciences and of Engineering, the American Academy of Arts and Sciences, and a member of the American Philosophical Society. He was the author of 20 books and held about 90 patents.

Pierce is survived by his wife, Brenda Woodard-Pierce, of Sunnyvale, a son, John J. Pierce of Bloomfield, New Jersey, and a daughter, Anne Pierce, of Summit, New Jersey. □ —*JD*

The material quoted above comes from articles in Engineering & Science*, October 1971 and November 1981.*

New Humanities and Social Sciences Division Chair

She has traveled alone in a war-torn area of Africa and listened to lions pad around her tent at night, but now Caltech professor of anthropology Jean Ensminger takes on a different challenge, as the new chair of the Division of the Humanities and Social Sciences.

In making the announcement, Caltech provost Steve Koonin commented, "Jean brings a distinguished record of teaching and research, fine judgment, and demonstrated management skills to an important position of academic leadership within the Institute. We are very fortunate that someone of her talents is willing to take on this important responsibility."

Ensminger will be the first woman to serve as division chair at Caltech, and will take the helm on June 15, replacing John Ledyard, professor of economics and social sciences, who will be returning, he says, to "the best position in the world: full professor at Caltech." He will redirect his energies to his research in market and organization design, or focus on a new, unrelated area, or "go sailing, if my boat is still afloat."

For her part, Ensminger is enthusiastic about the prospects for the division, and hopes to build on its successes over the last two decades. "The division has transformed the study of political science and political economy in ways now emulated and dominant in virtually every major university in America," she says, "and is currently incubating several areas of expertise that have the same potential for transforming disciplines as we know them today."

Specifically, she notes that the absence of disciplinary boundaries at Caltech is spawning research that will "reshape the philosophy of mind, behavioral economics, and the frontier between neuroscience, psychology, and economics, while the division's uniquely seamless boundary between literature and history, together with proximity to the Huntington Library, affords us another opportunity to blossom in the humanities."

Ensminger is an uncommon anthropologist: her line of research is in an area known as experimental economics, a field, she notes, that the division has played a