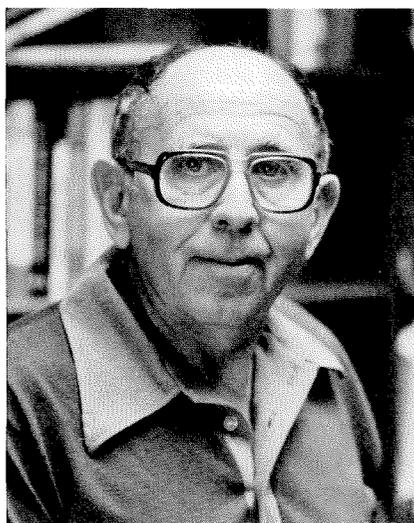


# Retirements — 1983



## Burton H. Klein

*Professor of Economics, Emeritus*

IN COLLEGE professors, the ability to concentrate on the matter at hand to the exclusion of all else sometimes leads to charges of absent-mindedness. In the case of Burt Klein, who became professor of economics emeritus at Caltech this year, it has also led to a reputation for a probing, original, and perceptive approach to whatever problem he is zeroing in on. "You don't always agree with his conclusions," says his colleague Alan Sweezy, "but you never fail to get a lot of new ideas about the possibilities."

One of Klein's conclusions is, for example, that industry needs to be more unstable, at least on the small-scale level of firms involved in all-out rivalry to dominate an active, technologically evolving field. That kind of instability, he says, produces a number of economic benefits, including large-scale stability in the economy as a whole. Klein is particularly interested in the economics of innovation and how it is related to organizational structure. He feels that many American organizations have become so stable that they have ossified. In explanation of his theories he has written a number of books, most recently *Dynamic Economics* and *The Slowdown in Productivity Advances: A Dynamic Explanation*.

Klein received both his AB and his PhD from Harvard, was a staff member

of the President's Council of Economic Advisers from 1948 to 1952, and then joined RAND Corporation. He became head of RAND's economics department in 1961, and came to Caltech in 1967. In addition he has served as a consultant to the Council of Economic Advisers, the Bureau of Budget, the Disarmament Agency, the Brookings Institution, and the Swedish and Israeli governments. A project that interests him currently is making a study of the differences between American and Japanese industry and productivity.

## Heinz Lowenstam

*Professor of Paleocology, Emeritus*

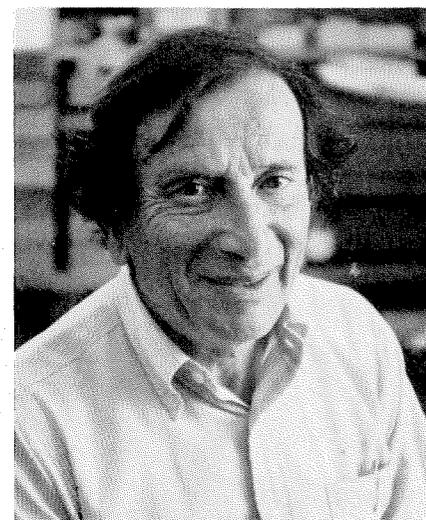
ORDINARILY, "survivor" and "pearl diver" are not words used to describe academicians, but Leon Silver, the Keck Foundation Professor of Resource Geology, chose them to characterize Heinz Lowenstam, who recently became professor of paleocology emeritus. Speaking at the May faculty dinner, Silver documented his usage with both biographical material and research evaluation. Lowenstam, he pointed out, who was born in Germany and attended the University of Munich, earned a PhD in paleontology in 1937. Under the influence of the Nazis, however, the degree was denied because Lowenstam is Jewish. (A happy footnote to this episode is that Munich did award him an honorary PhD in 1981 and created a symposium in his honor.)

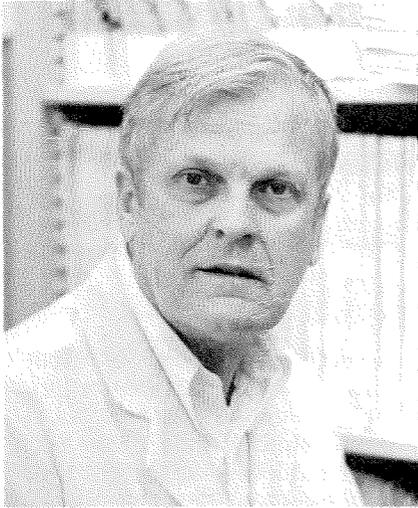
Actual survival probably was possible only because Lowenstam left Germany in 1937 for the United States. His scholastic credentials, in the form of two letters from his professors, were accepted by the University of Chicago, where he was granted a PhD in 1939. He did research for that degree on the geology of the East Nazareth Mountains in Palestine and later worked on local Illinois paleontology, getting to the field by riding the streetcar to the end of the line — where he found 400-million-year-old fossils in some outcrops. Over the next several years he worked as state

paleontologist at the Illinois State Museum, as a geologist for the Illinois State Geological Survey, and as research associate and then associate professor at the University of Chicago. In 1952 he came to Caltech as professor of paleocology.

Lowenstam's research has been distinguished, and he has been elected to the National Academy of Sciences and the American Academy of Arts and Sciences because of it. He is recognized as the developer of the thesis that ancient reefs are important petroleum habitats and, with Nobel Laureate Harold Urey and Sam Epstein (now professor of geochemistry at Caltech), of the ability to determine by means of oxygen isotopes the temperatures of ancient seas. These seas have continued to interest him, but he has also done research on modern reefs and the ecology of living as well as fossil marine organisms, being particularly interested in the evolution of their skeletal mineralogy. Recently he has been studying geochemical methods for distinguishing minerals produced by living organisms from inorganically formed minerals.

Petroleum habitats, the thermal history of oceans, and unforeseen mineral diversity in invertebrates are a few of the "pearls" Lowenstam has dived for and found, but, said Silver, "taking the unexpected point of view and thus forcing scientists to readdress fundamental questions is the hallmark of all his thinking, and that is his greatest contribution."





## James O. McCaldin

*Professor of Applied Physics and Electrical Engineering, Emeritus*

JAMES O. MCCALDIN has decided, after 15 years of teaching and directing graduate students, to go more fully into some of his other interests — including music and an Arizona ranch. So, in September, he adds “professor emeritus” to his academic title. McCaldin is known for his carefully thought-through advice to both graduate and undergraduate students and for making the freshman Solid-State Electronics Laboratory course one of the more enjoyable academic possibilities of the freshman year. When his other interests permit, he will continue to spend time at the Institute, pursuing his life-long interest in materials and devices and informally educating students in their subtleties.

McCaldin completed his PhD degree in engineering at Caltech in 1954. After a couple of years devoted to physical metallurgy at General Motors, he focused his efforts on semiconductor materials at the Hughes Aircraft Company, becoming department head for that activity. This work continued at the North American Aviation Science Center, after its founding in 1961. He is one of the pioneers in some of the key technologies that have made possible the current semiconductor revolution. He did early work on the planar process, for example, which is used in all modern

chip-based electronics. In some of the earliest papers on the subject, he established the use of ion implantation for doping semiconductor devices. In recent years, he has concentrated on the properties of interfaces and on developing methods for preparing semiconductor-grade crystals on dissimilar substrates. Says his colleague Thomas McGill, “His research has always been characterized by an adventuresome but scholarly development of a new concept that has frequently later become one of the keys to important technological developments.”

## Ray D. Owen

*Professor of Biology, Emeritus*

AT THE FACULTY dinner in May, Ray Owen was described by Kent Clark, professor of literature, as warmer than most people, “possibly because he was born in a cold climate and learned early to huddle”; a genius in immunogenetics, “National Academy and all that”; Welsh, “which means that he’s a singer (and a star in the Caltech Stock Company) and inherently crafty even though he looks increasingly guileless”; and with the tragic flaw of being a baseball fan (of the California Angels), “a curse on a level somewhere between having scabies and wearing a hair shirt.” All more or less true.

Wisconsin-born and of Welsh descent, Ray David Owen got his PhD at the University of Wisconsin in genetics in 1941. In 1947 he came to Caltech as associate professor of biology, became full professor in 1953, and professor emeritus in 1983. In the interim he has had an active and distinguished career. His research has been mainly in the fields of mammalian genetics and immunology and in such areas as tissue and organ transplantation and developmental studies. He is co-author with Adrian Srb and Robert Edgar of a widely used textbook, *General Genetics*.

In addition to membership in NAS, he belongs to a number of other learned

and professional societies. He has served as officer or board member for many of them and as a member of many national and state committees. He was president of the Genetics Society of America, for example, on the board of directors of the American Society of Human Genetics, and chairman of various committees for the National Institutes of Health and the National Science Foundation. For three years he was the “scientist-member” of the President’s Cancer Panel, acting in an advisory capacity to Presidents Nixon and Ford.

Somehow, Owen has also found time to be a conscientious and busy citizen of the Caltech community. He was chairman of the Division of Biology from 1961 to 1968 and vice president for student affairs and dean of students from 1975 to 1980. He has been a dedicated teacher throughout his career and is a recipient of an ASCIT award for teaching excellence. He found his chairmanship of the faculty committee on the freshman year at Caltech in the late 1960s particularly rewarding since its work led to the inauguration of pass-fail grading for freshmen, the introduction of electives into the freshman curriculum, and the admission of women to Caltech’s freshman class. For some or all of the above reasons, Owen was elected to honorary membership in the Caltech Alumni Association in June.

