

# The Month at Caltech

## *Luce Grant*

Caltech has received a \$225,000 grant from the Henry Luce Foundation, Inc., of New York to establish a Henry R. Luce Professorship in Law and Social Change in the Technological Society. A committee from the Division of Humanities and Social Sciences is already searching for a distinguished jurist to add to the Institute faculty—someone, according to Robert A. Huttenback, chairman of the division, “of humanist principles and wide philosophical perspective who can communicate the concept of a living law to our students.”

Although studies within the professorship will emphasize law as an instrument of social change, they will probably also include constitutional law, the nature of the legal process, and law in theory and practice.

The Luce award is part of a program the Foundation established three years ago to encourage academic innovation through an integrative approach to the study of the humanities and social sciences—an agenda that not only fits some of the Institute’s long-range plans but enhances such current projects as the Environmental Quality Laboratory, the Environmental Engineering Science program, and the population studies program being carried out jointly by Caltech and the American Universities Field Staff.

Near the end of the five-year period for which the grant has been made, both the Foundation and the Institute will reevaluate the program toward the possibility of a five-year continuation. The grant cannot exceed a total period of ten years.

## *Award to Feynman*

Richard P. Feynman, winner in 1965 of the Nobel Prize and Richard Chace Tolman Professor of Physics, has been awarded the 1971 Oersted Medal of the American Association of Physics Teachers for “notable contributions to the teaching of physics.”

Feynman, one of the world’s outstanding theoretical physicists, came to Caltech in 1950 from Cornell University. He was responsible for completely revising Caltech’s courses in introductory physics, and his lectures for Ph 1 and Ph 2 were eventually published as the three-volume *Lectures on Physics*. The “Feynman Lectures” are widely used in this country and in many other nations as texts for college freshman and sophomore physics courses.

## *Lacey Lecturer*

Andreas Acrivos, professor of chemical engineering at Stanford University, spoke at Caltech on January 25 and 27 as the fifth recipient of the W. N. Lacey Lectureship in Chemical Engineering.

Widely known for both his experimental and his theoretical contributions in a number of areas of chemical engineering, Acrivos is particularly distinguished in the field of fluid mechanics. Topics for his lectures at the Institute were “Suspension Rheology and the Theory of Isotropic Fluids” and “High Reynolds Number Laminar Flows with Separation. Some New Theoretical Results.”

The Lacey Lectureships, named in honor of William Noble Lacey, professor emeritus of chemical engineering who has been a member of the Institute faculty for 56 years, are made possible by a fund established by a number of Lacey’s friends and former students. It brings to campus world-renowned experts currently active in chemical engineering or related disciplines.

## *Courses with a New Look*

College students almost everywhere these days are asking that a few helpful “how-to” courses be added to their elective choices, and Caltech students are no exception. The Division of Humanities and Social Sciences has responded this year by offering several experimental courses that at least have pragmatic aspects—for example, not only the theory but also the practice of communicating, in writing, about scientific subjects.

Irving Bengelsdorf, Caltech’s director of science communication, is offering En 151, *Science Writing, Communication and Language*, during the winter term. Bengelsdorf, who has a PhD in chemistry and was a postdoctoral fellow at Caltech in 1951-52, served as science writer for the *Los Angeles Times* for almost nine years. He hopes to be able to teach his students to communicate briefly and clearly about science and engineering, not only to their colleagues but to laymen as well. He is covering writing styles and the techniques available for communicating through radio, television, and tapes; something of the history of communication; and enough scientific Russian to give some competence in translating titles of articles in Russian journals. There are lectures and discussions—and learning by doing. Every student writes a 700-word essay on an assigned topic each week, and essays are read aloud and criticized by the rest of the class.

David Morrisroe, director of financial services, took over the teaching of Ec 100, *Business Economics*, last fall. Ec 100 has been part of the Institute curriculum for more than 40 years—

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taught almost entirely by Horace Gilbert, professor of economics emeritus. Under Gilbert it was designed to give technically trained students a broad background in economics, management, and investments. But under Morrisroe, Ec 100 emphasizes managerial economics, reporting, and control; while it isn't mathematical, it *is* quantitative. During the first term, the 14 graduate students and 7 undergraduates who enrolled got a foundation in the theory and practice of managerial accounting and the understanding of financial information and control systems. Morrisroe supplemented his lectures with case material, and in problem-solving assignments the students really played the role of a financial manager in a business firm, or of an individual who had to deal with a financial manager. Concentration during second term is even more on case work, but the students are also applying some of the more recent developments in managerial economics to solving the case problems. Morrisroe points out that some of the practicalities of the course are immediate in terms of acquiring such skills as being able to interpret balance sheets, income statements, and fund flows. The long-term benefits should show up when, for example, students later have to set up budgets for research projects, deal with financial organization of an enterprise, or simply invest their personal funds.

PI 104, *Philosophy of Education*, is being taught this term by Lee Browne, lecturer in education and director of secondary school relations. By the end of the term each of the 14 students in the course will have to design a model school (for some segment of grades kindergarten through high school) and document his reasons for that design. For the documentation he will have such resources as class lectures and discussions, guest speakers, outside reading, and visits to local schools. Each model will have to specify requirements for pupils and staff in terms of skills and personal qualities, organization, curriculum, dealing with problems, relating the model to today's society, and the long-term goals expected of the model.

Browne believes that students need to start planning as early as possible for their careers, and that the schools are responsible for giving intelligent and

effective guidance toward that goal to every student—to those who will go into the professions *and* to those who are enrolled in vocational training. He hopes that his students in PI 104 will learn from their practice in setting up a model school both what *does* and what *could* go into giving the kind of education that will make it possible for everyone eventually to be gainfully employed. And, he suggests, anyone who takes this class and eventually becomes a teacher—even at the university level—may profit from understanding something of the teaching and learning process.

George S. Hammond, chairman of the division of chemistry and chemical engineering, is a leading writer and practitioner in the growing field of development of innovative methods in the teaching of science. These activities grow out of his concern that the sciences, and their implications, change more rapidly than their supporting teaching systems. In the hope of doing something constructive about it—both with and for

Caltech students—Hammond and Louis Breger, associate professor of psychology, are jointly teaching Ch 92ab, *Chemical Education* (also offered as Psy 101, *Selected Topics in Psychology*). Using lectures, discussions, outside reading, and movies, Hammond and Breger present elements of both educational and psychological learning theories and then consider how to apply those concepts to a specific body of subject matter—in this case chemistry. More generally, Hammond and Breger are convinced that the complex functions of an educational system profoundly influence society. "We may not be able to reshape educational functionality to suit our tastes," says Hammond, "but we will change it in more reasonable ways and live with it more comfortably if we take a clear look at what goes on." The appeal of this approach doesn't seem to be limited to students: The enrollment of about 20—undergraduates and graduates—is augmented by several auditors from the faculty.



Roy Gould

### *New Job for Gould*

Roy Gould, professor of electrical engineering and physics, has been appointed director of the Atomic Energy Commission's newly established division of controlled thermonuclear research. In this job he will supervise fusion-research efforts being conducted at the Lawrence Livermore, Los Alamos, and Oak Ridge Laboratories; at several private industrial laboratories; and at a number of universities.

Gould is a Caltech alumnus (BS '49, PhD '56) and has been a member of the faculty since 1955. Since April 1970 he has been on leave with the AEC in Washington, D.C.

## Detour for the Grand Tour

Funding for the "Grand Tour" of the solar system—under study at Caltech's Jet Propulsion Laboratory for a decade—has been deleted from the 1972 National Aeronautics and Space Administration budget. This means that multiple-planet exploration cannot take place in this century. The favorable lineup of the planets due in the late 1970's will not occur again until about the year 2150.

It was hoped that NASA, in its budget proposal to President Nixon, would ask at least for \$30 million in the next fiscal year to finance continued planning for two Grand Tour missions:

1. Two launches, planned for 1977, for flights to Jupiter, Saturn, and Pluto.
2. Two launches, projected for 1979, to scout Jupiter, Uranus, and Neptune.

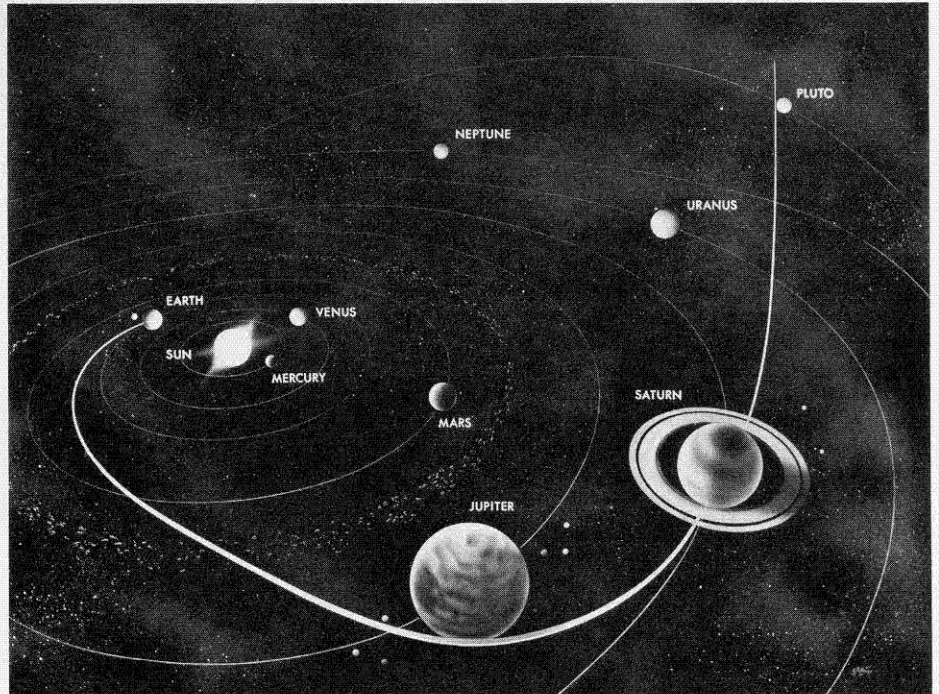
Instead, NASA asked for only \$7 million in "study money" in the submitted budget. This would not finance the Grand Tour as originally planned.

The cancellation will have little immediate effect on current JPL jobs or programs because the Grand Tour was not funded and was strictly in the research and drawing-board stage. JPL programs already funded up through 1975 include the Mariner Venus-Mercury flyby and a major portion of the 1975 Viking Mars-lander project.

Although the Grand Tour program is cancelled, there will still be opportunities for two or possibly three planet explorations on a reduced basis with Mariner- or Pioneer-type spacecraft if the money becomes available.

The Grand Tour concept involved using the gravity of one planet to propel a spacecraft in a "billiard ball" manner to the next planet. In this way one vehicle could explore Jupiter, Saturn, Uranus, Neptune, and Pluto in a 9- or 10-year accelerated flight.

Even if there should be a later reversal in the funding decision, JPL will lose more than a year of hard planning, which would make it difficult to get ready to launch between 1977 and 1979.



Cancelled for lack of funding, the Grand Tour would have made possible a fly-by look at as many as four of the outer planets on a single flight—and would have reduced the time ordinarily needed for such exploration by as much as two-thirds.

## Sloan Foundation Grant

The Alfred P. Sloan Foundation is making a grant of \$610,000 to Caltech to extend research and teaching in the neurosciences. The funds will provide partial support for four research groups for a period of four years.

Headed by Derek Fender, professor of biology and applied science; Felix Strumwasser, professor of biology; Michael Raftery, associate professor of chemical biology; and Richard Russell, assistant professor of biology, these four groups will investigate such key questions in neurobiology and neurochemistry as: How does the human brain work? What is the composition of the synapse (the specialized contact region of the neurons through which they communicate with each other)? How do neurons produce and read out the programs that control the temporal organization of behavior?

Though these programs are already in progress—with laboratories, techniques, and equipment specifically adapted to this work—the Sloan grant will make possible an increase in their tempo and scope by expanding facilities and adding research people and graduate students to the groups.

## Honors to Stern

Alfred Stern, professor of philosophy emeritus, was recently awarded the decoration of Officer in the Order of Leopold II. This honor was bestowed on him by King Baudoin in recognition of the services Stern rendered Belgium before, during, and after World War II and in appreciation of his achievements as a philosophical writer. His latest book, *The Search for Meaning: Philosophical Vistas*, is reviewed on page 32.

Stern also recently delivered the official lecture at the University of Vienna on the occasion of the 50th anniversary of the founding of the university's Philosophical Society.