

The Month at Caltech

New Trustees

Caltech has added three new members to its board of trustees. James W. Glanville, Dean A. McGee, and James E. Robison bring the total membership of the board to its maximum size of 45.

James Glanville is a Caltech alumnus and a life member of the Institute Associates. After receiving his BS from Rice University, he obtained an MS in chemical engineering from Caltech in 1946 and an engineer's degree in 1948.

He is a partner in the New York investment firm of Lehman Brothers and is a director of several oil companies and of the International Minerals and Chemicals Corporation.

Dean McGee is board chairman and chief executive officer of Kerr-McGee Corporation of Oklahoma City. He heads or is director of all Kerr-McGee affiliates in this country and abroad.

A graduate of the University of Kansas, McGee taught geology there for a year and then joined Phillips Petroleum Company. He was chief geologist at Phillips when he resigned to become vice president of Kerlyn Oil Company, predecessor to Kerr-McGee. He serves on the board of directors of the General Electric Company, the Oklahoma Natural Gas Company, and the Fidelity National Bank and Trust Company.

James Robison, board chairman and chief executive officer of Indian Head Inc., graduated from the University of Minnesota and holds an MBA from the Harvard Graduate School of Business Administration. He has remained active at Harvard University, formerly as board chairman of the Associates of the Harvard Business School, and currently as a member of the visiting committee of its Graduate School of Business Administration and of the executive council of the Harvard Business School Association.

Robison has served on the President's Advisory Committee for Trade Negotiations, and for six months in 1961 he was chief of the textile branch of the Office of Price Administration. Before joining Indian Head as president and chief executive officer in 1953, Robison was executive vice president of Textron, Inc.

Professor Emeritus

Frederick C. Lindvall, professor of electrical and mechanical engineering, becomes professor emeritus this month. Chairman of Caltech's division of engineering and applied science for 23 years, he retired as division head in 1968. Since then he has been on leave of absence as vice president of Deere & Company in Moline, Ill., and as a consultant for the President's Office of Science and Technology.

Lindvall received his bachelor's degree in railway engineering at the University of Illinois in 1924 and his PhD in electrical engineering at Caltech in 1928. He then joined the General Electric Company. In 1930 he returned to Caltech as an instructor. He became assistant professor in 1931, associate professor in 1937, and full professor in 1942. He was named division chairman in 1945.

As chairman, Lindvall guided the division through a diversification and broadening process that radically altered the nature of engineering education at the Institute and had nationwide influence as well. The old categories of electrical, mechanical, and civil engineering metamorphosed into such fields as fluid and solid mechanics, materials science, environmental health engineering, biosystems, and information science. To complaints that this hardly sounded like engineering Lindvall replied: "We have certainly not abandoned the concept of engineering. Basically we're trying to give an education that doesn't suffer from technological obsolescence. The engineer is vital in the process of putting a system together as well as designing components of it. But the old methods aren't applicable any more, so we're trying to find new ways of teaching our



James Olds

Four New Professorships

Four new professorships have been established at Caltech, and four distinguished faculty members have been appointed to them.

James Olds is the first Bing Professor of Behavioral Biology. This chair is the gift of Peter Bing and his mother, Mrs. Anna Bing Arnold, through the Bing Foundation.

Olds' discovery of self-reinforcing brain centers has contributed to the understanding of the physiology of motivation, learning, and memory. He has also contributed productive theories and ideas about how the brain processes, analyzes, and stores information, and about how it makes decisions. His

engineers how to design."

As a result of his work on revision of the engineering curriculum, Lindvall has become a widely travelled and prominent spokesman for engineering education in general. In 1966 he received the Lamme Award of the American Academy of Engineering Education for his contributions in both areas.

Lindvall's own research interests have been in the areas of vacuum switching, glow discharge phenomena, the dynamics of rail and road vehicles, and research management. He is a member of the National Academy of Engineering and of the National Research Council, and is a fellow of the American Society of Mechanical Engineers and the American Institute of Electrical and Electronic Engineers.



Max Delbrück

spectra of low-luminosity white dwarf stars, with particular reference to the final stages of cooling and fading of stars.

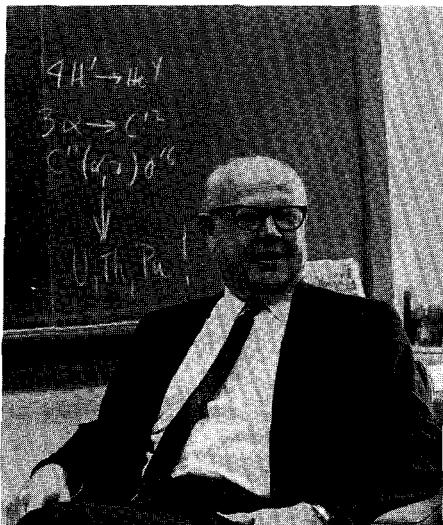
The first Institute Professorship, awarded by Caltech to give special honor to outstanding members of the faculty, is held by William A. Fowler, professor of physics.

A pioneer in investigating the nature of nuclear forces of the light chemical elements, Fowler developed the idea that nuclear processes make the stars shine, and that chemical elements in stars evolve from the light to the heavier elements.

Fowler has also made contributions to current knowledge of nuclear forces and reaction rates, nuclear spectroscopy, and the structure of light nuclei. His current research centers on the general relativistic effects in quasar and pulsar models.

Max Delbrück has been appointed Albert Billings Ruddock Professor of Biology. This chair was given in honor of Albert Ruddock, a member of the Institute Board of Trustees from 1938 until his death in July 1970 and its chairman from 1954 to 1961.

Delbrück, winner of the 1969 Nobel Prize in physiology and medicine, was honored for his discoveries concerning the replication mechanism and genetic structure of viruses that set the foundation for molecular genetics. Since that time his research interests have shifted to sensory physiology. Using sporangiophores of the fungus *Phycomyces* as a model system, Delbrück has studied stimulus transduction in order to clarify the molecular nature of the primary transducer processes of sense organs.

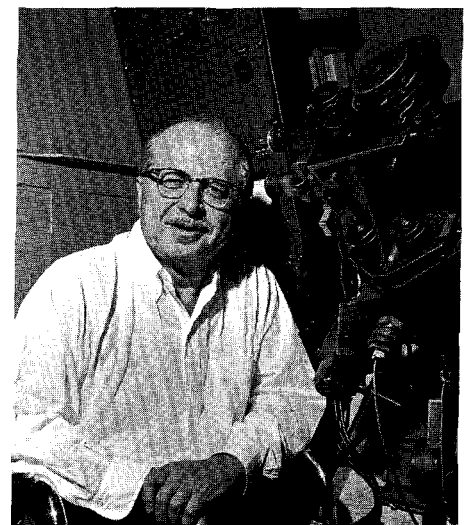


William A. Fowler

current experiments constitute a new attack on the locus and mechanisms of learning and memory storage in the brain.

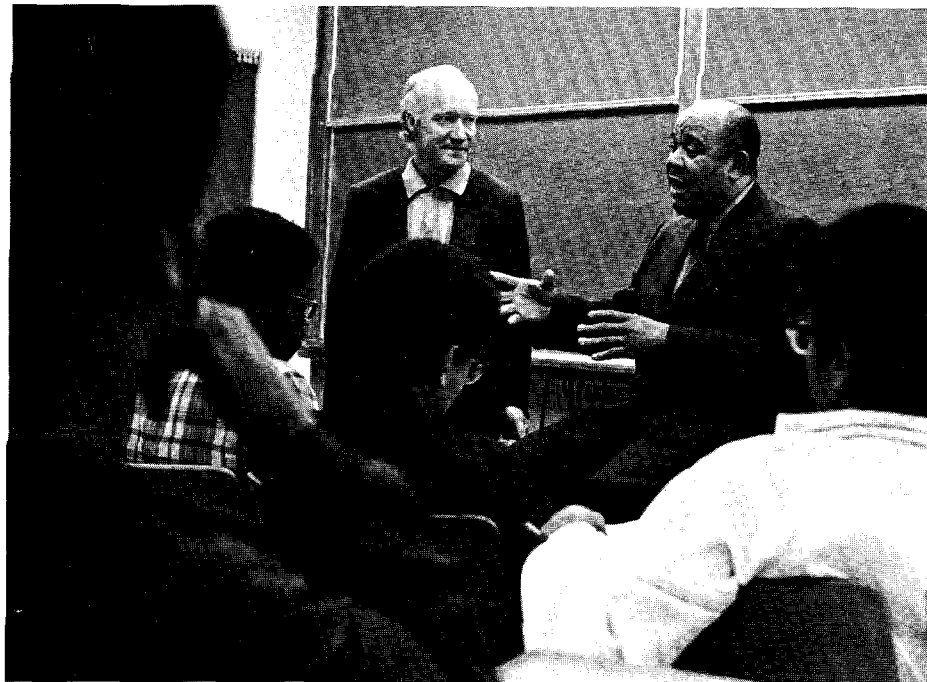
Jesse L. Greenstein has been named Lee A. DuBridge Professor of Astrophysics. He is the first man to hold the new DuBridge Professorship funded by gifts of The Associates of the California Institute of Technology and named in honor of Lee DuBridge, president of Caltech from 1946 to 1968.

Greenstein is expert in the discovery of peculiar stars and the study of their composition from their spectra. In collaboration with Caltech physicists he developed the now accepted theory connecting differences in the compositions of stars with the nuclear energy-producing processes occurring in their interiors. At Palomar he has studied the



Jesse L. Greenstein

Robert Walker, professor of physics, and Lee Browne run a summer course for entering freshmen.



Lee Browne

Lee F. Browne, who was formerly high school science coordinator for the Pasadena city schools, came to Caltech in July as director of the Institute's new office of secondary school relations. He is working with Lyman Bonner, director of student relations.

A teacher himself, Browne has a special interest in developing methods of selecting and guiding students of minority groups. During the past year he has been working closely with Caltech on its junior high school science project. This program started in the summer of 1969 with 24 Pasadena ninth-graders—all bright, all interested in science, most from minority groups, and some not doing too well in school. After living on campus and working closely with some faculty and students for eight weeks, the young people elected to continue their Caltech liaison in Saturday morning workshops through the school year. In the summer of 1970, ten ninth-graders who showed aptitude for independent study spent seven weeks working in Caltech laboratories with faculty and students. Sixteen others spent their mornings for six weeks covering a one-year course in biology at Blair High School in Pasadena, and afternoons being tutored by graduate students at Caltech.

During the current academic year this program is being expanded so that about 100 seventh, eighth, and ninth grade students are coming to the Caltech campus for informal Saturday workshops in such subjects as mathematics, biology, chemistry, physics, electricity, computer science, and photography. The students can elect any subject that interests them and put in as much time as they like on it. The schedule is arranged so that there is tutoring from 10 a.m. till noon, then lunch, and more classwork from 1:30 till 3:30. They can continue working in the same class in

the afternoon, take another, or just play, and they are free to change classes when they like. Because they are all highly motivated young people, they are encouraged to work with their instructors to develop the curricula.

In working to improve Caltech's secondary school recruiting programs, Browne is particularly concerned about students who show talent and motivation for science, but are not qualified for Caltech by the usual standards of grades and tests. Last spring, therefore, faculty interviewers offered admission to Caltech to three girls and ten young men who they felt would make the grade at the Institute with some bolstering in English, physics, and mathematics. The students arrived on campus in August to take part in another program set up by Browne in which they put in six weeks of intensive work with Caltech faculty and student tutors.

Some other Browne programs:

1. A monthly Wednesday afternoon lecture series in Beckman Auditorium for junior and senior high school students. Kip Thorne, professor of theoretical physics, launched the series on October 7, talking about "When the Sun Stops Burning." George Hammond, chairman of the division of chemistry and chemical engineering, speaks on "The Fruitful Fantasies of Science" on November 4. Jerome Pine, professor of physics; Norman Davidson, professor of chemistry; and John Benton, professor of history, are scheduled for future talks. Students will be asked to

write essays about the talks, and in June prizes will be awarded for the outstanding essays.

2. Caltech's annual Students' Day will be replaced by a series of 12 Saturday programs for groups of students and teachers from a few high schools at a time. They will be given personalized tours, talks, science demonstrations, and lunch on campus.

3. Lecture teams, usually consisting of Browne, a professor, and a graduate and an undergraduate student, will conduct demonstration lectures at high school science assemblies.

4. In a cooperative program with the Pasadena school system, Caltech students—usually graduate—at teachers' requests, will go to classrooms on a short-term basis to teach certain specifics of science, mathematics, and social science. Caltech graduate students are also available to tutor junior and senior high school students upon request by their teachers.

5. Older high school students—eleventh and twelfth graders—who want to undertake independent study programs can talk about it with Browne, who will then try to arrange for them to work in laboratories on campus. At present six such students are in this program—three in chemistry, two with Jerome Vinograd in chemistry and biology, and one in information science.

6. Topping it all off—so far—is an art program in which high school students will be invited to join Caltech's evening art classes.