

The Month at Caltech

New Course

Caltech students in aeronautics have always had excellent training in the theory of such flight-related topics as fluid and solid mechanics, jet propulsion, and flight dynamics. In fact, their theoretical training has been so thorough that few of them have much understanding of the compromises necessary to develop a functioning system in any large aerospace project.

A new course is being offered for the first time this year to help solve that problem. Ae 207, Case Histories in Aerospace Engineering, is designed to introduce students to the entire management program—financing, customer relations, and long-range planning, as well as interactions between technical groups.

Supervised by aeronautics professors Homer J. Stewart and Ernest E. Sechler, Ae 207 started this fall with an enrollment of 14—2 seniors and 12 graduate students. The subject for the first term is the Mariner 9 mission to Mars, and scientists and engineers from Caltech's Jet Propulsion Laboratory are giving lectures on such subjects as how the project began, how it was organized, designing the spacecraft, development of the instruments, and evaluation of the scientific results.

Development of the DC-10 airliner is the subject for second term, and key men from McDonnell Douglas Corporation will give the lectures. Among the topics for discussion will be the economic analyses made to determine the need for the system, airline and passenger requirements, financing, aerodynamic and structural analyses, wind tunnel and flight testing programs, how materials used in building the plane were chosen, inside and outside acoustic problems, marketing, and planning for advanced or modified models.

The topic of the third term will be announced later, but it too will cover a fairly recent aerospace project.

Theory, of course, continues to be the basis of what is taught at Caltech, but students who have taken Ae 207 will also have learned that more than theory must go into solving production problems.

In Memoriam

Caltech lost two long-time friends and trustees in October—men whose terms of service to the Institute totaled more than 50 years.

John Barber, 1886-1973

John E. Barber, who died on October 2 at the age of 86, was first elected to the board in 1954 and became a life trustee in 1966. He had served as both vice president and treasurer, and was valued for his counsel in financial affairs. He was also a life member of The Associates, and had served as president, vice president, and secretary of that organization.

Mr. Barber was a native of Toledo, Ohio, and graduated from Yale in 1910 with membership in Phi Beta Kappa. He went

into the investment business in New York, and after World War I served with the Dawes Commission on Reparations in Europe. Moving to Pasadena in 1920, he became president of various financial organizations which today are components of Security Pacific National Bank. During the 1930's he headed utility companies in the Middle West, returning to Pasadena during World War II. He was associated with U.S. Steel Corporation, retiring as treasurer of its subsidiary, Columbia-Geneva Corporation. In retirement he was closely associated with Disney Enterprises and was instrumental in arranging the financing of Disneyland.

Mr. Barber is survived by his wife, a son, and two daughters, 14 grandchildren, and one great granddaughter.

Lake Throop



The 59th annual Mudeo on October 21 had a lot of favorable factors: the spacious Throop site for a temporary lake, a warm day, enthusiastic participants—including girls—and

the largest audience in years. What wasn't so favorable, for the freshmen at least, was the outcome. For the first time in 11 years the sophomores won. Score 6½ to 2½.

Caltech's Man on Skylab 3

Norman Chandler, 1899-1973

Norman Chandler died on October 20 at the age of 74. He had been a trustee since 1941, continuing a family tradition that began in 1920 when his father was elected to the board. He was also a life member of The Associates.

Mr. Chandler was born in Los Angeles and went to Hollywood High School. He graduated from Stanford University in 1922 and immediately joined the *Los Angeles Times*, becoming assistant general manager in 1934 and, in 1936, vice president and general manager. In 1941, when his father moved up to board chairman, he became president of Times Mirror. In 1944 he was appointed publisher of the *Times*, a post he held until 1960. Since that time he has been board chairman and chief executive officer.

The *Times* editorial of October 23 said of him: "To public service in the ordinary sense of the phrase he was no stranger. He served on many boards. He was a trustee of USC and, for more than 30 devoted years, of Caltech. He worked, often quietly but always powerfully, on many civic enterprises . . . To the thousands of persons here and around the world who knew Norman Chandler in his business and public capacities, he was a man of dignity and gentle forcefulness. Those who knew him more intimately had the great good fortune to know even better his indelible personal qualities—his unflinching thoughtfulness, his natural courtesy, his resolute, unpretentious courage, his steadfast allegiance to family, to friends, to associates and to conscience."

Mr. Chandler leaves his wife, son, a daughter, eight grandchildren, a brother, and two sisters.

A Norman Chandler memorial fund has been established. Tax deductible contributions may be made to the California Institute of Technology with the notation that they are for this fund.

It could be just a coincidence, but the National Aeronautics and Space Administration seems to be developing a taste for putting a Caltech graduate on the final flight of each of its space programs. In December 1972, Harrison Schmitt (BS '57) was pilot-astronaut for Apollo 17, the last of the U.S. manned moon-landing missions. Now, the last of the current series of manned earth-orbiting missions—Skylab 3—has been launched carrying Edward Gibson (MS '60, PhD '64) as its science pilot.

The 37-year-old Gibson graduated from high school in Kenmore, New York, and got a BS in engineering from the University of Rochester in June 1959. He came to Caltech that fall to work toward his MS in mechanical engineering, with a jet propulsion option, and stayed on for his PhD in mechanical engineering, minoring in physics.

For a year following his graduation, Gibson was a senior research scientist at Philco Corporation's Applied Research Laboratories in Newport Beach. While there he did work on lasers and the optical breakdown of gases and published a number of papers on plasma physics.



Ed Gibson

Selected as a scientist-astronaut by NASA in June 1965, Gibson spent 53 weeks in flight training before joining the astronaut group in 1966. He served in a number of backup positions for the manned lunar missions, and in 1969 was selected as a member of the astronaut support crew for Apollo 12. Since the completion of the Apollo program, he has been in training for Skylab.

In the meantime Gibson's scientific interests have shifted slightly—from classical and plasma physics to solar physics. He wrote the training document on solar physics for the Skylab astronauts, which has been published under the title *The Quiet Sun*.

As the science pilot for Skylab 3, Gibson is responsible for all the studies of the earth's resources; investigations of the earth's upper atmosphere, the interplanetary plasma, and the sun; medical experiments; galactic and intergalactic astronomical observations; and an analysis of the possible technological uses of near-earth orbital space—all, of course, with the active collaboration of his fellow astronauts, Mission Commander Gerald Carr and Pilot William Pogue.

If this sounds like a lot, consider also that the three men constitute a rookie crew, none of them having flown in space before. And they are orbiting the earth in a craft that is only partially operating and rapidly deteriorating. Gibson, however, is optimistic about the "advantages of being one of the last in line"—and so another Caltech graduate is doing what he can to wrap up NASA's current program in the great style to which the space agency is becoming accustomed.

The Month at Caltech ... *continued*

Honors, Awards, and Appointments

Nobel laureate Richard Feynman received the Niels Bohr International Gold Medal in Copenhagen last month—directly from Queen Margrethe. The prestigious medal is awarded by the Danish Engineering Society every third year “to an engineer or scientist in recognition of outstanding work for the peaceful utilization of atomic energy.” The first of the medals was given in 1955 to one of the founders of modern physics—Niels Bohr himself.

Feynman, who is Richard Chace Tolman Professor of Theoretical Physics at Caltech, has contributed greatly to the understanding of the structure of the atom, particularly in quantum electrodynamics, the field for which he was awarded the Nobel Prize in 1965.



One bow, a gold medal, and two smiles are the order of the day for Denmark's Queen Margrethe and Caltech's Richard Feynman.

A. J. Haagen-Smit, professor of bio-organic chemistry emeritus, received the National Medal of Science in Washington, D.C., on October 10. He was honored “for his discovery of the chemical nature of the source of smog, and for the successful efforts he carried through in smog abatement.”

For over 25 years Haagen-Smit has been a protagonist in the battle against smog at all levels of industry and government. He is currently both chairman of the California Air Resources Board and head of the President's task force on air pollution.

Established in 1963, the National Medal of Science is awarded to prominent scientists who “in the judgment of the President are deserving of special recognition for their outstanding contributions to knowledge in the physical, biological, mathematical, and engineering sciences.” The very first medal was given to Theodore von Karman in 1963. Since then three other members of Caltech's faculty have received it: A. H. Sturtevant in 1967, and John Pierce and Allan Sandage in 1971.

The national professional fraternity for chemists, Alpha Chi Sigma, has given its 1973 award for chemical engineering research to C. J. Pings, professor of chemical engineering and chemical physics. The award, which consists of a certificate and \$1,000, recognizes outstanding recent accomplishments in fundamental or applied research in the field. Pings was cited for contributions to the measurements of the properties of liquids, the development of new approaches to the prediction of those properties, and for the use of modern instrumentation techniques for more precise measurements of diffusivities.

Pings is a Caltech alumnus (BS '51, MS '52, PhD '55) and has been a faculty member since 1959. He is also now vice provost and dean of graduate studies.

Regular readers of *Engineering and Science* magazine may have noticed that we tend to shun the use of capital letters—a style known in our trade as “down.” Imagine how startled we were to find ourselves typing the following copiously capitalized item:

Michael E. Levine, Henry R. Luce Professor of Law and Social Change in the Technological Society, has been appointed to Los Angeles Mayor Tom Bradley's Council on Controlling the Cost of Living.

In so worthy a cause, we're really happy to have things looking “up.”

A Caltech professor and an alumnus were recent recipients of awards from the National Aeronautics and Space Administration.

Donald S. Burnett, associate professor of nuclear geochemistry, has been awarded the NASA Exceptional Scientific Achievement Medal “for his outstanding contribution to the achievement of lunar science in the design and implementation of the lunar neutron probe experiment which successfully measured the neutron flux in the lunar surface during the Apollo 17 mission.” The experiment made it possible to determine the rates at which neutrons have reacted with lunar material and how depth causes these rates to vary (*E&S*, February). Burnett received his BS at the University of Chicago in 1959 and his PhD at UC Berkeley in 1963. He then came to Caltech to do postdoctoral research in physics. In 1965 he joined the Division of Geological and Planetary Sciences, and in 1968 was awarded a two-year Alfred P. Sloan Foundation Fellowship for research in geochemistry.

Alumnus Frank E. Goddard Jr. (PhD '57), assistant director for research and development at Caltech's Jet Propulsion Laboratory received the NASA Exceptional Service Medal for “outstanding performance in advancing the technology of automated spacecraft design.”