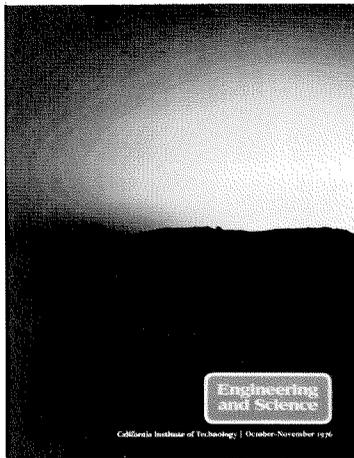


In This Issue



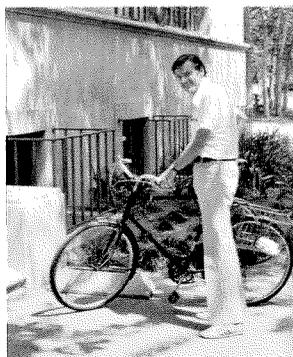
At Sundown

On the cover — the Martian sunset over Chryse Plain, photographed on August 20 by Viking 1. The camera began scanning the scene from the left shortly after the sun had dipped below the horizon. By the time the picture was completed the sun had dropped nearly 3 degrees below the horizon. About 5 degrees above the sharp line of the horizon the sky color grades from blue to red. This color variation is explained by a combination of scattering and absorption of sunlight by atmospheric particles.

Several more spectacular views of Mars taken by the Viking landers appear in "Mars — Up Close" on page 16.

Energy

Conservation of energy is so important these days that it is no surprise to find Robert H. Cannon Jr., chairman of Caltech's division of engineering and applied science, riding a bicycle to the campus — and pointing out that technology can make major contributions to solving the energy problem. Cannon is not only in an administrative position to be up on the latest in engineering research, he's done a lot of it himself — in such fields



Cannon

as the dynamics of rigid bodies and fluids, hydrofoil boats, automatic flight and space vehicle control, gyroscopes, and inertial guidance. He has served on the faculties of Stanford and MIT and has led research teams at the Autonetics Division of North American Aviation and at the Bendix Aviation Research Labs.

From 1970 to 1974 Cannon was U.S. assistant secretary of transportation for systems development and technology. It was under his leadership that DOT established the Transportation Systems Center at Cambridge, Massachusetts, with projects that included studies of a new air traffic control system, high-speed ground vehicles, automated control of highway and ship traffic, aircraft and truck noise abatement, and stringent control of pollution of the stratosphere and of the oceans.

Recently Cannon put it all together in a Watson Lecture at Beckman Auditorium. "Smart Energy: A Key Role for Computers" on page 9 is adapted from that talk.

More Energy

The general session speaker for Caltech's 39th Alumni Seminar Day was Robert C. Seamans Jr., administrator for the U.S. Energy Research and Development Administration (ERDA). Introducing him, Caltech alumnus Carel Otte (MS '50, PhD '54) said in part: "Our speaker was born and raised in Massachusetts and went to school there, receiving a BS in engineering at Harvard, and his MS and PhD from MIT. We will forgive him for that.

"As an indication of the diversity of his interests, he serves on the Board of Trustees of the National Geographic Society; he has worked in industry for RCA; and he worked before that for NASA — both as associate and as deputy administrator. He's been a professor at MIT, was Secretary of the Air Force from 1969 to 1973, and has been president of the National Academy of Engineering.

"Since December 1974 he has been the administrator for ERDA, which combines the former energy research and development programs of the AEC, the Department of the Interior, and the National Science Foundation, and which also has the respon-

sibility for nuclear weapons research, development, and production. We welcome Dr. Seamans to talk on 'Energy Realities for Tomorrow.'"

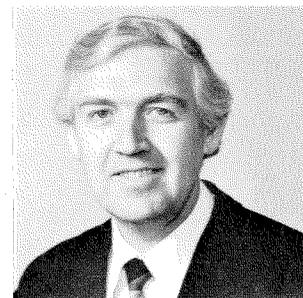
On page 13, *E&S* presents excerpts from that talk.

Groundwork

More than a hundred scientists and engineers from all over the world came to Caltech not long ago to attend a workshop on the use of centrifuges to test models of man-made and natural structures. The organizer of the meeting (which was jointly sponsored by Caltech and the National Science Foundation) was Ronald F. Scott, professor of civil engineering. An adaptation of Scott's lighthearted introduction to the proceedings, "Centrifuges in the Earth Sciences: A Revolutionary Idea," appears on page 18.

Centrifuges are an interest of Scott's because of their possible applications to research in his specialty — the mechanics of deformation and yielding in soils, which he has studied in almost every earthly condition and location — frozen, thawing, shaken by earthquakes, and on the ocean bottom, for example. Though he hasn't made any trips into space, he's also knowledgeable about extraterrestrial soils. He was principal investigator on lunar soil properties for the Surveyor spacecraft, and a member of the soil mechanics team for the Apollo manned lunar missions. Currently, he is a member of the physical properties team for the Viking missions to Mars.

Scott, a native of London, England, was educated at Glasgow University in Scotland and at MIT, taking his ScD there in 1955. He came to Caltech in 1958.



Scott

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