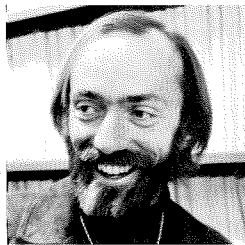


# In This Issue



### Familiar Figure

With Lee DuBridge behind the podium, commencement last June was in some ways just like old times, the main difference being that on this occasion he was the speaker of the day instead of the presiding officer. Nevertheless, he was still doing what he has been doing ever since 1946 when he became Caltech's president, namely, his best for the Institute. Though DuBridge, who has been president emeritus for nine years, claims that he has given up his "addiction" to public speaking, "Some Dilemmas in Science" on page 5 demonstrates that he hasn't lost any of his well-remembered ability to communicate.



### Black Holes

Understanding the universe around us is partly a matter of understanding the deaths of stars, among which are those stars that die to form black holes. Black holes and the waves of gravity produced by their birth throes are major preoccupations of those scientists whose research is called "relativistic astrophysics." One of the Institute's leaders in the field is Kip Thorne, who recently spoke on the subject at a Symposium on Science and the Future of the Navy, held to observe the thirtieth anniversary of the Office of Naval Research. "Probing the Universe: Big Bang, Black Holes, and Gravitational Waves" on page 17 is adapted from that talk and published here by permission of the Naval Studies Board of the National Academy of Sciences.

Thorne received his BS at Caltech in 1962 and his PhD from Princeton in 1965. He returned to the Institute in 1966 as a research fellow in physics and is now professor of theoretical physics. Since 1971 he has also been an adjunct professor of physics at the University of Utah. A

distinguished scientist, Thorne is an articulate interpreter of science as well. In 1969, for example, he was winner of a \$1000 prize from the American Institute of Physics - United States Steel Foundation for the year's best science writing in physics and astronomy.



### Model Scientist

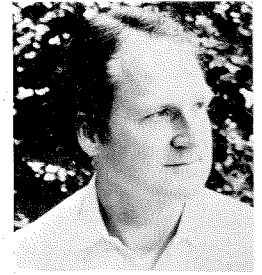
To discuss the potentials and limitations of computer simulation of the industrial society is no small assignment. But it didn't stump Donella Meadows, associate professor of environmental studies at Dartmouth College, who recently did just that at Caltech's conference on The Next Eighty Years. What is more, she brought a refreshing objectivity and a straightforward vocabulary to the task. "Computer Modeling: How Good Is It?" on page 11 is adapted from that talk.

A graduate of Carleton College, BA '63, and Harvard University, PhD '68, Meadows began her career as a biophysicist specializing in enzymology and spectroscopy. She has since become more and more interested in and occupied with systems analysis, and she has a considerable list of publications that bring both of these competencies to bear.

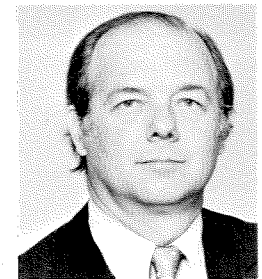
In 1972 she was a co-author of a highly controversial book, *Limits to Growth*, which presented a computer model of the world. Partly as a result of that controversy and also to compare other world models as they have been developed and elaborated, the International Institute for Applied Systems Analysis has been set up in Laxenberg, Austria, by the United States, the Soviet Union, and several eastern European countries. Meadows is currently a research scientist on its staff.

### The Rolling Stones

According to alumnus John D. Bush, '55, his interest in primitive technology developed after he bought an abandoned granite quarry. Bush wanted to move some of its stones, but they weighed up to 200 tons and he didn't have a crane. Assisted by his BS in mechanical engineering, professional experience as a machine design consultant, and a look into such historical records as he could find, Bush was able to devise his own methods.



In fact, not only did he move some of those stones, but he came up with a theory of how the ancient Egyptians built the pyramids, using much less manpower than is generally assumed. In "The Rolling Stones" on page 23 Bush tells how it may have been done. "It's too bad," he says, "that Cecil B. DeMille didn't know my theory before he made *The Ten Commandments*. He could have saved a lot of money on extras."



### Our Man in Bucharest

When a devastating earthquake struck Romania on March 4, Caltech alumnus Frank Lamson-Scribner, '46, was there. "Bucharest '77—Richter 7.2" on page 24 is his on-the-spot account of the experience, and we have illustrated it with a photograph of the devastation that we got from one of Caltech's noted authorities on earthquake damage to structures, George Housner, Carl F Braun Professor of Engineering.

Lamson-Scribner happened to be in that place at that time as a member of the World Bank's Economic Development Institute (EDI), an organization whose objective is to promote a more efficient economic development by training officials from the developing countries. Since 1973 he has helped with the training of over 100 senior Romanian officials in industrial project analysis. He uses a course that he designed especially for centrally planned economies as a cooperative effort of EDI and the Romanian Communist Party's institution for training senior officials.

Home for Lamson-Scribner is a house near Annapolis, Maryland, that he built almost entirely by himself, "putting my engineering education to good use," he says, "but occasionally wishing I had had a good shop course."