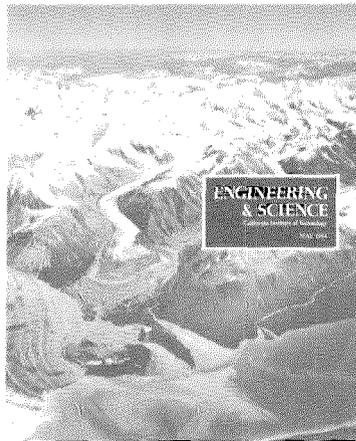


In This Issue



Galloping Glacier

On the cover — view from above of Alaska's Variegated Glacier (the elbow-shaped ribbon just left of center) with the St. Elias Range in the background. The picture was taken last August after the glacier's surge sent it "galloping" forward, chopping it up into the deep crevasses visible even from the air.

The view for someone camped on the glacier was still more impressive — and more than slightly harrowing. But the surge provided a rare opportunity to study the mechanisms of glacier flow, and since Barclay Kamb had been watching and monitoring Variegated Glacier for 10 years in anticipation of the event, he and his team were not about to be deterred by a few crevasses. Some of their experiences and what they discovered about surging glaciers are described starting on page 6 in "The Surge of an Alaskan Glacier: A Moving Experience."

This is not the first glacier to appear on the cover of *E&S*. The January 1958 and February 1965 issues featured Blue Glacier in Olympic National Park, Washington, on the cover; Kamb was also involved in that project.

In between camping expeditions on glaciers, Kamb has spent a lot of time at Caltech. He received his BS here in 1952 and PhD in 1956. A member of the faculty ever since, he became professor of geology and geophysics in 1963; from 1972 to 1983 he was chairman of the Division of Geological and Planetary Sciences.

Immune Response



Ellen Rothenberg came to Caltech as assistant professor of biology two years ago. Her research concerns the

rich and complex field of cellular immunology. Beginning on page 11, her article, "Innocence and Experience in the Immune System," describes some of this research as well as some background about the major actors in the immune system and the "education" for their roles.

Rothenberg earned her AB in biological sciences summa cum laude from Harvard in 1972 and a PhD in molecular biology from MIT in 1977. In the five intervening years before setting up her lab here, she was a research associate at MIT's Center for Cancer Research, research fellow at the Memorial Sloan-Kettering Cancer Center, and assistant research professor at the Salk Institute for Biological Studies.

The article here is adapted from her Watson lecture in January, at which Ray Owen, professor of biology, emeritus, introduced her as "a congenial colleague, an effective and caring teacher, and a concerned member of the larger Institute community."

Safety Man

Large dams and the possibility of large earthquakes keep uneasy company with each other in many parts of the world, making major losses of life and damage to property an ever-present threat. Fortunately, civil engineers and modern computers are also getting together to bring increasing sophistication into the search for ways to design new dams and to evaluate the safety of existing ones. In "Dams and Earthquake Safety," which begins on page 17,



John Hall discusses some of the problems and new approaches to their solution. Hall has been interested in structural analysis and design for quite a while. One of his early summer jobs, in fact, was as a highway and bridge inspector for the West Virginia Department of Highways. He got his BS in civil engineering from West Virginia University in 1972, his MS from the University of Illinois in 1973, and his PhD from UC Berkeley in 1980. He then came to Caltech as a research fellow in earthquake engineering and became assistant professor of civil engineering in 1983.

John Hall discusses some of the problems and new approaches to their solution. Hall has been interested in structural analysis and design for quite a while. One of his early summer jobs, in fact, was as a highway and bridge inspector for the West Virginia Department of Highways. He got his BS in civil engineering from West Virginia University in 1972, his MS from the University of Illinois in 1973, and his PhD from UC Berkeley in 1980. He then came to Caltech as a research fellow in earthquake engineering and became assistant professor of civil engineering in 1983.

STAFF: *Editor* — Jacquelyn Bonner
Managing Editor — Jane Dietrich
Photographer — Robert Paz

PICTURE CREDITS: Cover — North Pacific Aerial Surveys, Inc./
6-10 — Barclay Kamb/Inside front cover, 28 — Robert Paz/24 — Richard Kee/
25 — Charles Lane/28 — Martha Ward

Engineering & Science (ISSN 0013-7812) is published five times a year, September, November, January, March, and May, at the California Institute of Technology, 1201 East California Boulevard, Pasadena, California 91125. Annual subscription \$7.50 domestic, \$15.00 foreign, \$20.00 foreign air mail, single copies \$1.50. Third class postage paid at Pasadena, California. All rights reserved. Reproduction of material contained herein forbidden without authorization. ©1984 Alumni Association California Institute of Technology. Published by the California Institute of Technology and the Alumni Association. Telephone: 818-356-4686. Postmaster: Send change of address to Caltech, 1-71, Pasadena, CA 91125.