### Editorial

281  Planetary Fluids

### Perspective

283  Sodium-Calcium Exchange in Excitable Cells: Fuzzy Space: W. J. Lederer, E. Niggli, R. W. Hadley

### Letters


### News & Comment

292  Stanford Erupts Over Indirect Costs
295  East Germany Struggles to Clean Its Air and Water
296  NIH: The Endless Search
297  Scientific Misconduct Cases Revealed Bromley Promises Small Science Focus
298  Gordon & Breach Impanels a Journal Jury
299  How the United States Stacks Up in Key Technologies

### Research News

300  A Generational Rift in Geophysics Not So Irreconcilable Differences?
303  Is AIDS Dementia Due to Increases in Calcium?
304  Polymer Chemists Are Having a ROMP
305  “Hairy Enzymes” Stay in the Blood

### Articles

308  Atmospheric Dynamics of the Outer Planets: A. P. Ingersoll
316  The Dynamics of the Oceanic Subtropical Gyres: J. Pedlosky
323  Scales and Effects of Fluid Flow in the Upper Crust: L. M. Cathles III
329  Fluid Processes in Subduction Zones: S. M. Peacock
337  Mantle Oxidation State and Its Relationship to Tectonic Environment and Fluid Speciation: B. J. Wood, L. T. Bryndzia, K. E. Johnson
345  Paleomagnetism and the Nature of the Geodynamo: R. T. Merrill and P. L. McFadden

---

**Notes:**

- **SCIENCE** is published weekly on Friday, except the last week in December, and with a supplement in March by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class Non-profit postage (publication No. 484660) paid at Washington, DC, and at an additional entry. Copyright © 1990 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): $75. Domestic institutional subscription (51 issues): $120. Foreign postage extra: Canada $46, other (surface mail) $46, air mail via Amsterdam $85. First class, airmail, school-year, and student rates on request. Single copies (Current issue, $3.50; back issues, $5.00; Biotechnology issue, $6.00 (for postage and handling, add per copy $0.50 U.S., $1.00 all foreign); Guide to Biotechnology Products and Instruments, $20 (for postage and handling add per copy $1.00 U.S., $1.50 Canada, $2.00 all foreign). Bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $1 per copy plus $.10 per page is paid directly to CCC, 27 Congress Street, Salem, Massachusetts 01970. The identification code for Science is 0036-8075/83 $1 + .10. Change of address: allow 6 weeks, giving old and new addresses and 11-digit account number. Postmaster: Send Form 3579 to Science, P.O. Box 1723, Riverston, NJ 08077. Science is indexed in the Reader’s Guide to Periodical Literature and in several specialized indexes.

- **The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.**
The Champagne Pool, named for its CO₂ bubbles, provides an interesting window into fluid processes beneath Waiotapu, the largest area of surface thermal activity in New Zealand. The pool occupies a 900-year-old hydrothermal explosion crater. Evaporation cools the surface waters from 100°C to about 75°C, producing the steam. Amorphous silica, blown by the wind to the sides, settles as an orange coating that contains 80 parts per million of gold and 175 parts per million of silver. See page 323. [Photograph by L. M. Cathles]