

7 This Week in *Science*

Editorial

- 9 1989 New Year's Resolution: Go to Heaven

Letters

- 11 Potential Use of Nerve Growth Factor to Treat Alzheimer's Disease: Ad Hoc Working Group on Nerve Growth Factor and Alzheimer's Disease ■ Petition on Dugway Facility: N. C. FRANKLIN ■ Energy Options: A. B. LOVINS ■ FDA Approval of HTLV-I Tests: R. A. MONTAGNA; D. BARNES ■ Retraction: C. J. GOLDENBERG

News & Comment

- 17 Universities Fight Animal Activists
20 NIH Scientists Agonize Over Technology Transfer
21 NAE: Revamp Export Controls
Samuel Broder New Head of NCI
22 NSF Opens High-Speed Computer Network
24 Bush Makes Some Science Appointments

Research News

- 25 Is It Chaos, or Is It Just Noise? ■ The Onset of Chaos
28 How to Fix the Clouds in Greenhouse Models
29 Neurotoxicity Creates Regulatory Dilemma
30 Getting a Grip on Elliptic Curves
32 *Random Samples*: We Have Met the Enemy and It Is Us ■ Bagging the Albatross ■ The Fire (Ants) This Time

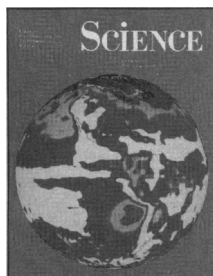
Articles

- 37 Ecological Effects of a Major Oil Spill on Panamanian Coastal Marine Communities: J. B. C. JACKSON, J. D. CUBIT, B. D. KELLER, V. BATISTA, K. BURNS, H. M. CAFFEY, R. L. CALDWELL, S. D. GARRITY *et al.*
45 Protein Structure Determination in Solution by Nuclear Magnetic Resonance Spectroscopy: K. WÜTHRICH
51 Innovative Approaches to Plasminogen Activator Therapy: E. HABER, T. QUERTERMOUS, G. R. MATSUEDA, M. S. RUNGE

Research Articles

- 57 Cloud-Radiative Forcing and Climate: Results from the Earth Radiation Budget Experiment: V. RAMANATHAN, R. D. CESS, E. F. HARRISON, P. MINNIS, B. R. BARKSTROM, E. AHMAD, D. HARTMANN

- SCIENCE is published weekly on Friday, except the last week in December, and with an extra issue in February by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and at an additional entry. Now combined with *The Scientific Monthly*® Copyright © 1989 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): \$70. Domestic institutional subscription (51 issues): \$110. Foreign postage extra: Canada \$32, other (surface mail) \$32, air-surface via Amsterdam \$85. First class, airmail, school-year, and student rates on request. **Single copy sales:** 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, \$18 (for postage and handling add per copy \$1.00 U.S., \$1.50 Canada, \$2.00 other foreign). Bulk rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. 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 \$0.10 per page is paid directly to CCC, 21 Congress Street, Salem, Massachusetts 01970. The identification code for *Science* is 0036-8075/83 \$1 + .10. **Postmaster:** Send Form 3579 to *Science*, 1333 H Street, NW, Washington, DC 20005. *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 objects 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, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.



COVER Depiction of the effect of clouds on the radiative heating of the planet as determined from the NASA Earth Radiation Budget Experiment. Regions where clouds have a cooling effect are shown in green and blue (dark blue, strongest effect). The cooling effect arises because the reflection of solar radiation by clouds exceeds their greenhouse effect. In yellow regions the two effects nearly cancel; rust indicates slight heating. Globally, the satellite data revealed that clouds have a large cooling effect on the radiation budget of the planet. See page 57. [V. Ramanathan *et al.*, Department of Geophysical Sciences, University of Chicago, Chicago, IL 60637; color images processed at NASA Langley Research Center, Hampton, VA 23665]

Reports

- 64 Atom Counting at Surfaces: D. L. PAPPAS, D. M. HRUBOWCHAK, M. H. ERVIN, N. WINOGRAD
- 66 Submicrometer Superconducting $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ Particles Made by a Low-Temperature Synthetic Route: H. S. HOROWITZ, S. J. MCLAIN, A. W. SLEIGHT, J. D. DRULINER, P. L. GAI, M. J. VANKAVELAAR, J. L. WAGNER *et al.*
- 69 Effects of Buried Ionizable Amino Acids on the Reduction Potential of Recombinant Myoglobin: R. VARADARAJAN, T. E. ZEWERT, H. B. GRAY, S. G. BOXER
- 72 Evolution of Urea Synthesis in Vertebrates: The Piscine Connection: T. P. MOMMSEN AND P. J. WALSH
- 75 Phylogenetic Meaning of the Kingdom Concept: An Unusual Ribosomal RNA from *Giardia lamblia*: M. L. SOGIN, J. H. GUNDERSON, H. J. ELWOOD, R. A. ALONSO, D. A. PEATTIE
- 78 Duplication, Deletion, and Polymorphism in the Sex-Determining Region of the Mouse Y Chromosome: G. MARDON, R. MOSHER, C. M. DISTECHE, Y. NISHIOKA, A. MCLAREN, D. C. PAGE
- 80 Chromosome Mapping and Expression of a Putative Testis-Determining Gene in Mouse: C. M. NAGAMINE, K. CHAN, C. A. KOZAK, YUN-FAT LAU
- 83 Pavlovian Conditioning of Rat Mucosal Mast Cells to Secrete Rat Mast Cell Protease II: G. MACQUEEN, J. MARSHALL, M. PERDUE, S. SIEGEL, J. BIENENSTOCK
- 85 Structural Origins of High-Affinity Biotin Binding to Streptavidin: P. C. WEBER, D. H. OHLENDORF, J. J. WENDOLOSKI, F. R. SALEMME
- 89 Transneuronal Transfer of Herpes Virus from Peripheral Nerves to Cortex and Brainstem: G. UGOLINI, H. G. J. M. KUYPERS, P. L. STRICK
- 91 Rapid Redistribution of Auxin-Regulated RNAs During Gravitropism: B. A. McCLURE AND T. GUILFOYLE
- 93 Gating of Retinal Transmission by Afferent Eye Position and Movement Signals: R. LAL AND M. J. FRIEDLANDER

Book Reviews

- 99 Maternal Employment and Children's Development, *reviewed by* J. T. MORTIMER ■ War Stars, S. W. LESLIE ■ U.S. Coast Survey vs. Naval Hydrologic Office, M. ROTHENBERG ■ Biotechnology and Materials Science, W. F. DEGRADO ■ The Evolution of Complexity by Means of Natural Selection, M. L. MCKINNEY ■ Books Received

Products & Materials

- 105 Nucleic Acid Sequencer ■ Safety Coated Bottles ■ Cloned DNA Polymerase ■ Statistical Software ■ Isocratic Chromatography Pump ■ Microtiter-Plate Washer ■ Literature

Board of Directors

Sheila E. Widnall
*Retiring President,
Chairman*

Walter E. Massey
President

Richard C. Atkinson
President-elect

Floyd E. Bloom
Mary E. Clutter
Eugene H. Cota-Robles
Mildred S. Dresselhaus
Joseph G. Gavin, Jr.
John H. Gibbons
Beatrix A. Hamburg
Donald N. Langenberg

William T. Golden
Treasurer

Philip H. Abelson
Executive Officer, Acting

Editorial Board

Elizabeth E. Bailey
David Baltimore
William F. Brinkman
E. Margaret Burbidge
Philip E. Converse
Joseph L. Goldstein
Mary L. Good
F. Clark Howell
James D. Idol, Jr.
Leon Knopoff
Oliver E. Nelson
Helen M. Ranney
David M. Raup
Howard A. Schneiderman
Larry L. Smarr
Robert M. Solow
James D. Watson

Board of Reviewing Editors

John Abelson
Qais Al-Awqati
Don L. Anderson
Stephen J. Benkovic
Floyd E. Bloom
Henry R. Bourne
James J. Bull
Kathryn Calame
Charles R. Cantor
Ralph J. Cicerone
John M. Coffin
Robert Dorfman
Bruce F. Eldridge
Paul T. Englund
Frederic S. Fay
Theodore H. Geballe

Roger I. M. Glass
Stephen P. Goff
Robert B. Goldberg
Corey S. Goodman
Jack Gorski
Stephen J. Gould
Richard M. Held
Gloria Heppner
Eric F. Johnson
Konrad B. Krauskopf
Charles S. Levings III
Richard Losick
Karl L. Magleby
Philippa Marrack
Joseph B. Martin
John C. McGiff
Mortimer Mishkin
Gordon H. Orrians
Carl O. Pabo

Yeshayau Pocker
Michael I. Posner
Dennis A. Powers
Russell Ross
James E. Rothman
Erkki Ruoslahti
Ronald H. Schwartz
Vernon L. Smith
Robert T. N. Tjian
Virginia Trimble
Emil R. Unanue
Geerat J. Vermeij
Bert Vogelstein
Harold Weintraub
Irving L. Weissman
George M. Whitesides
Owen N. Witte
William B. Wood

Science

243 (4887)

Science **243** (4887), 7-105.

ARTICLE TOOLS

<http://science.sciencemag.org/content/243/4887>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 1989 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.