

607 This Week in *Science*

## Editorial

609 To Lift the Lamp Beside the Research Door

## Letters

610 Space Flight: Manned Versus Unmanned: J. R. ARNOLD; B. BOVA; J. H. LAUB;  
J. A. VAN ALLEN

## News & Comment

612 Was Galileo Saved by Plea Bargain?

613 The Buried Cost of the Savannah River Plant ■ Down on the Sludge Farm

615 Petersdorf to Head Medical Colleges

616 *Briefing*: House Endorses Pork Barrel Funding ■ Britain Offers Plan for Chemical Weapons Verification ■ OMB and Congress at Odds Over Cancer Risk Policy ■ Britain's Royal Society Condemns Sex Bias in Math Teaching ■ New Animal Regulations Causing Scientists Pain and Distress ■ Time Inc. Buys *Science Digest*

## Research News

620 Shifting Sentiments Over Sequencing the Human Genome

621 Tracing a Young and Malleable Moho

623 *Briefing*: Sodium Atoms Trapped with Laser Light ■ Laser-Cooling Mercury Ions Via Beryllium ■ RNA Plasmid Discovered in Maize Mitochondria

## Articles

625 Computing with Neural Circuits: A Model: J. J. HOPFIELD and D. W. TANK

633 Arctic Research in the National Interest: A. L. WASHBURN and G. WELLER

640 The Use of NMR Spectroscopy for the Understanding of Disease: G. K. RADD

■ SCIENCE is published weekly on Friday, except the last week in December, and with a plus issue in May 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 © 1986 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): \$65. Domestic institutional subscription (51 issues): \$98. Foreign postage extra: Canada \$24, other (surface mail) \$27, air-surface via Amsterdam \$65. First class, airmail, school-year, and student rates on request. Single copies \$2.50 (\$3 by mail); back issues \$4 (\$4.50 by mail); Biotechnology issue, \$5.50 (\$6 by mail); classroom rates on request; Guide to Biotechnology Products and Instruments \$16 (\$17 by mail). **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** Bell tower of First United Methodist Church in Chatham, Cape Cod, Massachusetts, at dawn (6:26 a.m. on 23 June 1986; solar elevation:  $12^{\circ}35.4'$  above horizon; natural illuminance levels: 12,200 lux ambient and 6,300 lux in the line of gaze). Exposure to artificial light of comparable intensity can rapidly reset the human circadian pacemaker by about 6 hours. See page 667. [Charles A. Czeisler, Neuroendocrinology Laboratory, Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02115]

## Reports

- 647 Tandem Regions of Yeast DNA Topoisomerase II Share Homology with Different Subunits of Bacterial Gyrase: R. LYNN, G. GIAEVER, S. L. SWANBERG, J. C. WANG
- 649 The Oncogenic Activation of Human p21<sup>ras</sup> by a Novel Mechanism: M. WALTER, S. G. CLARK, A. D. LEVINSON
- 652 Immunoregulatory Feedback Between Interleukin-1 and Glucocorticoid Hormones: H. BESEDOVSKY, A. DEL REY, E. SORKIN, C. A. DINARELLO
- 655 Infectious Mutants of HTLV-III with Changes in the 3' Region and Markedly Reduced Cytopathic Effects: A. G. FISHER, L. RATNER, H. MITSUYA, L. M. MARSELLE, M. E. HARPER, S. BRODER, R. C. GALLO, F. WONG-STAAAL
- 659 Probing Steric and Hydrophobic Effects on Enzyme-Substrate Interactions by Protein Engineering: D. A. ESTELL, T. P. GRAYCAR, J. V. MILLER, D. B. POWERS, J. P. BURNIER, P. G. NG, J. A. WELLS
- 663 A Mouse Homeo Box Gene Is Expressed in Spermatocytes and Embryos: M. R. RUBIN, L. E. TOTH, M. D. PATEL, P. D'EUSTACHIO, M. C. NGUYEN-HUU
- 667 Bright Light Resets the Human Circadian Pacemaker Independent of the Timing of the Sleep-Wake Cycle: C. A. CZEISLER, J. S. ALLAN, S. H. STROGATZ, J. M. RONDA, R. SÁNCHEZ, C. D. RÍOS, W. O. FREITAG *et al.*

## Book Reviews

- 672 Wild Horses of the Great Basin, *reviewed by* P. J. JARMAN ■ The Miocene Ocean, J. H. LIPPS ■ Properties and Interactions of Interplanetary Dust, B. DONN ■ Some Other Books of Interest ■ Books Received

## Products & Materials

- 676 Test Kit for Interleukin-2 ■ Sample Changer for Titrator ■ DNA Recovery from Electrophoresis Gels ■ Personal Supercomputer ■ Fluorometer ■ Fluorescence Microscope ■ Literature

### Board of Directors

Gerard Piel  
*Retiring President,  
Chairman*

Lawrence Bogorad  
*President*

Sheila E. Widnall  
*President-elect*

Robert McC. Adams  
Robert W. Berliner  
Floyd E. Bloom  
Mary E. Clutter  
Mildred S. Dresselhaus  
Donald N. Langenberg  
Dorothy Nelkin  
Linda S. Wilson

William T. Golden  
*Treasurer*

William D. Carey  
*Executive Officer*

### Editorial Board

David Baltimore  
William F. Brinkman  
Ansley J. Coale  
Joseph L. Goldstein  
James D. Idol, Jr.  
Leon Knopoff  
Seymour Lipset  
Walter Massey  
Oliver E. Nelson  
Allen Newell  
Ruth Patrick  
David V. Ragone  
Vera C. Rubin  
Howard E. Simmons  
Solomon H. Snyder  
Robert M. Solow

### Board of Reviewing Editors

Qais Al-Awqati  
James P. Allison  
Luis W. Alvarez  
Don L. Anderson  
C. Paul Bianchi  
Elizabeth H. Blackburn  
Floyd E. Bloom  
Charles R. Cantor  
James H. Clark  
Bruce F. Eldridge  
Stanley Falkow  
Theodore H. Geballe  
Roger I. M. Glass

Stephen P. Goff  
Robert B. Goldberg  
Patricia S. Goldman-Rakic  
Corey S. Goodman  
Richard M. Held  
Gloria Heppner  
Eric F. Johnson  
Konrad B. Krauskopf  
Karl L. Magleby  
Joseph B. Martin  
John C. McGiff  
Alton Meister  
Mortimer Mishkin  
Peter Olson  
Gordon H. Orians  
John S. Pearce  
Yeshayau Pocker  
Jean Paul Revel

Frederic M. Richards  
James E. Rothman  
Thomas C. Schelling  
Ronald H. Schwartz  
Stephen M. Schwartz  
Otto T. Solbrig  
Robert T. N. Tjian  
Virginia Trimble  
Geerat J. Vermeij  
Martin G. Weigert  
Irving L. Weissman  
George M. Whitesides  
Owen N. Witte  
William B. Wood  
Harriet Zuckerman

# Science

**233 (4764)**

*Science* **233** (4764), 607-676.

ARTICLE TOOLS

<http://science.sciencemag.org/content/233/4764>

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. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.