7 This Week in Science

Editorial

9 Sensors, Computers, and Actuators

Letters

10 The Overhead Question: P. E. Gray; S. C. Beering and R. M. Rosenzweig; R. Barker; R. Eldridge; A. E. Seigman; J. J. Algo; J. M. Schurr; P. D. Boyer; R. Seebass; D. E. Koshland, Jr.

News & Comment

14 Science Beyond the Pale

17 Researchers Declare Crisis, Seek Funding Solutions ■ Planning a Budget: In God We Trust?

18 Multidisciplinary Look at a Finite World

20 Briefings: AID Aids AIDS Efforts with New Syringes ■ Director Contenders只是 Say No to NIH ■ How to Save Endangered Species ■ Primate Find Surprises Biologists ■ Three Mile Island "Turns Around" ■ Weed Genes ■ English Physics Hits the Fat Farm ■ The NASA Vegematic ■ Advanced Photons

Research News

22 Bad News from the Bacteria ■ The Policy Response: In Limbo

25 Hubble's Managers Start to Survey the Damage

26 DORIS Gets a Face-Lift

Mount Graham Observatory on the Brink

27 Diamond Films Sparkle as They Come to Market ■ Ultra Diamond from Pure Carbon-12

Articles

31 The CFC-Ozone Issue: Progress on the Development of Alternatives to CFCs: L. E. Manzer

36 The Z Boson: M. S. Chanowitz

Research Articles


Reports

48 Television Image of a Large Upward Electrical Discharge Above a Thunderstorm System: R. C. Franz, R. J. Nemzek, J. R. Winckler

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. 484460) 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): $60. Domestic institutional subscription (51 issues): $150. 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 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, $20 (for postage and handling add per copy $1.00 U.S., $1.50 Canada, $2.00 other 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 $0.10 per page is paid directly to CCC, 27 Congress Street, Salem, Massachusetts 01970. The identification code for Science is 0036-8075. 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, Riverton, 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.
cover  Chip entrainment by the katydid Mecopoda to periodic acoustic stimulation at two different stimulus intensities: plots obtained by iteration of the Poincaré map. The abscissa represents input stimulus rate and the ordinate, phase. At each stimulus rate the map was iterated 50 times: the first 10 iterations are represented by yellow dots while the last 40 iterations (steady-state) are shown in red. The plots identify regions of phase-locked response. See page 55.

51 Seawater Strontium Isotopic Variations from 2.5 Million Years Ago to the Present: R. C. Capo and D. J. DePaolo
55 Synchronous, Alternating, and Phase-Locked Stridulation by a Tropical Katydid: E. Sismondo
64 An Insulin-Stimulated Protein Kinase Similar to Yeast Kinases Involved in Cell Cycle Control: T. G. Boulton, G. D. Yancopoulos, J. S. Gregory, C. Slatter, C. Moomaw, J. Hsü, M. H. Cobb
70 Intercalation Complex of Proflavine with DNA: Structure and Dynamics by Solid-State NMR: P. Tang, C.-L. Juang, G. S. Harbison
73 Site-Specific Cleavage of a Yeast Chromosome by Oligonucleotide-Directed Triple-Helix Formation: S. A. Strobel and P. B. Dervan

Inside AAAS

Entries for Behavioral Science Research Prize ■ Trilateral Science Summit Held in Budapest ■ Elements of Chaos ■ Arctic Division Call for Papers ■ SWARM Division Meeting ■ AAAS Handbook ■ Westinghouse Award for Public Understanding of Science ■ AAAS Environmental Fellows

Book Reviews

Mesoamerica After the Decline of Teotihuacan, A.D. 700–900, and Tula of the Toltecs, reviewed by: D. Freidel ■ Astronomer by Chance, J. V. Evans ■ Evolutionary Phenomena in Galaxies, V. Trimble ■ Books Received

Products & Materials

Computer for Measuring Geological Resistance ■ Chromatography Storage Cabinets ■ Thermal Cycler for DNA Sequencing ■ Containment Vacuum Cleaner ■ Software for Drawing Figures ■ Protein Purification System ■ Literature

Board of Directors
Richard C. Atkinson Retiring President, Chairman
Donald N. Langenberg President
Leon M. Lederman President-elect
Mary Ellen Avery
Francisco J. Ayala
Eugene H. Cola-Robles
Robert A. Frolich
Joseph G. Gavrin, Jr.
John H. Gibbons
Beatriz A. Hamburg
Florence P. Haseltine
William T. Golden Treasurer
Richard S. Nicholson Executive Officer

Editorial Board
Elizabeth E. Bailey
David Baltimore
William F. Brinkman
E. Margaret Burbidge
Pierre-Gilles de Gennes
Joseph L. Goldstein
Mary L. Good
F. Clark Howat
James D. Idol, Jr.
Leon Knoppoff
Olive E. Nelson
Yasutomi Nishizuka
Helen M. Rainey
David M. Raup
Howard A. Schneiderman
Larry L. Smarr
Robert M. Solow
James D. Watson

Board of Reviewing Editors
John Abelson
Don L. Anderson
Stephen J. Benkovic
Gunter K.-J. Blobel
Floyd E. Bloom
Henry R. Bourne
James E. Bull
Kathryn Calame
Charles R. Cantor
Ralph C. Cileire
John M. Coffin
Robert Dornab
Bruce F. Eldridge
Paul T. Englert
Fredric S. Fay
Harry A. Fozzard

Theodore H. Geballe
Roger I. M. Glass
Stephen P. Goff
Corey S. Goodman
Stephen J. Gould
Eric F. Johnson
Stephen M. Kostyak
Konrad B. Krauskopf
Charles S. Leavings III
Richard Losick
Joseph B. Martin
John C. McGuff
Anthony R. Means
Moritmer Mishkin
Roger A. Nicoll
William H. Orme-Johnson III
Carl D. Pabo
Yoshiyasu Pocker

Dennis A. Powers
Eriki Roseala
Thomas W. Schoen
Ronald H. Schwartz
Teresa E. Sajewski
Robert T. N. Tjan
Virginia Trimble
Emil R. Unanue
Geerat J. Vermeij
Bert Vogelstein
Harold Weintraub
Irving L. Weissman
Zena Werb
George M. Whitesides
Owen N. Witte
William B. Wood
Keith Yamamoto