

1259 This Week in *Science*

Editorial

1261 Random Samples

Letters

1263 AIDS Case Definition: H. H. IMREY; J. W. CURRAN, M. MORGAN ■ U.S. Observing Facilities: S. L. KEIL ■ Retirement Policy: L. M. FRIEDMAN; E. L. PATTULLO

News & Comment

1265 OTA Disputes U.S. Policy on Test Ban
1266 Cantor to Head LBL Genome Center
1267 The Coming Competition Among Clot-Busting Drugs
1269 A Prod to Productivity
1270 U.K. Earth Sciences: Some More Equal Than Others?
1271 A Fuel Shortage in Space?
1272 House Votes Ban on Low-Flying Missiles

Research News

1273 The Social Lives of Dolphins
1275 Fermat's Last Theorem Remains Unproved ■ When Good Proofs Go Bad
1277 Hotshots, Hotspots, and Female Preference
1278 Mapping by X-Ray Zapping
1279 *Random Samples*: Welcome, Engineers ■ The St. Louis Chinchillas? ■ Antiques at the NSF Dinner ■ Tell Me. Don't Tell Me

Articles

1285 Measuring the Accuracy of Diagnostic Systems: J. A. SWETS
1293 The El Niño Cycle: A Natural Oscillator of the Pacific Ocean-Atmosphere System: N. E. GRAHAM AND W. B. WHITE
1302 DNA Damage and Oxygen Radical Toxicity: J. A. IMLAY AND S. LINN

Research Articles

1310 Chimeric α_2 - β_2 -Adrenergic Receptors: Delineation of Domains Involved in Effector Coupling and Ligand Binding Specificity: B. K. KOBILKA, T. S. KOBILKA, K. DANIEL, J. W. REGAN, M. G. CARON, R. J. LEFKOWITZ

■ 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 © 1988 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 copies \$3.00 (\$3.50 by mail); back issues \$4.50 (\$5.00 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 Rat hippocampal slices supported on a nylon mesh laid over a polyethylene sheet in one compartment of a dual, linear flow, incubation and recording chamber. The 5-hour-old transverse slices (0.4 millimeter thick, 5 to 6 millimeters long, and 2 to 3 millimeters wide) are perfused with artificial cerebrospinal fluid and oxygenated with a humidified gas mixture of 95% oxygen and 5% carbon dioxide. See page 1326. [Robert D. Acland, School of Medicine, University of Louisville, Louisville, KY 40292]

Reports

- 1317 Seismic Slip and Down-Dip Strain Rates in Wadati-Benioff Zones: M. BEVIS
- 1319 Bacterial Manganese Reduction and Growth with Manganese Oxide as the Sole Electron Acceptor: C. R. MYERS AND K. H. NEALSON
- 1321 Potassium Salt Microinjection into *Xenopus* Oocytes Mimics Gonadotropin Treatment: Y.-T. LAU, R. R. YASSIN, S. B. HOROWITZ
- 1324 Epitopes Recognized by Human T Cells Map Within the Conserved Part of the GP190 of *P. falciparum*: A. CRISANTI, H.-M. MÜLLER, C. HILBICH, F. SINIGAGLIA, H. MATILE, M. MCKAY, J. SCAIFE, K. BEYREUTHER, *et al.*
- 1326 Lactate-Supported Synaptic Function in the Rat Hippocampal Slice Preparation: A. SCHURR, C. A. WEST, B. M. RIGOR
- 1328 Expression of *c-fos* Protein in Brain: Metabolic Mapping at the Cellular Level: S. M. SAGER, F. R. SHARP, T. CURRAN
- 1331 Familial Imprinting Determines H-2 Selective Mating Preferences: K. YAMAZAKI, G. K. BEAUCHAMP, D. KUPNIEWSKI, J. BARD, L. THOMAS, E. A. BOYSE
- 1333 A Model-Based Estimate of the Mean Incubation Period for AIDS in Homosexual Men: K.-J. LUI, W. W. DARROW, G. W. RUTHERFORD, III
- 1335 Location and Chemical Synthesis of a Binding Site for HIV-1 on the CD4 Protein: B. A. JAMESON, P. E. RAO, L. I. KONG, B. H. HAHN, G. M. SHAW, L. E. HOOD, S. B. H. KENT
- 1339 Expression of the β -Nerve Growth Factor Gene in Hippocampal Neurons: C. AYER-LELIEVRE, L. OLSON, T. EBENDAL, Å. SEIGER, H. PERSSON

AAAS News

- 1345 AAAS Annual Elections: Preliminary Announcement ■ *SB&F* Focuses on AIDS Education ■ Scientific Fraud and Misconduct Report Available ■ What's in a Name?

Book Reviews

- 1349 New Directions in Ecological Physiology, *reviewed by* F. H. POUGH ■ Perinatal Development, P. G. NELSON ■ Virulence Mechanisms of Bacterial Pathogens, A. B. ÖNDERDONK ■ Books Received

Software Reviews

- 1353 Equation-Solving Programs for the Personal Computer: K. R. FOSTER

Products & Materials

- 1359 Benchtop GC-MS-DS System ■ CCD Camera System ■ Microplate Reader ■ DNA Labeling Kit ■ Mammalian Cell Cultivation ■ Methyl Phosphonate DNA Oligonucleotides ■ Plant Tissue Culture Products ■ 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
Beatrix A. Hamburg
Donald N. Langenberg

William T. Golden
Treasurer

Alvin W. Trivelpiece
Executive Officer

Editorial Board

Elizabeth E. Bailey
David Baltimore
William F. Brinkman
E. Margaret Burbidge
Philip E. Converse
Joseph L. Goldstein
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
James J. Bull
Charles R. Cantor
Ralph J. Cicerone
John M. Coffin
Bruce F. Eldridge
Paul T. Englund
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
Jiri Novotny
Gordon H. Orians
Carl O. Pabo
John S. Pearce

Yeshayau Pocker
Michael I. Posner
Jean Paul Revel
Russell Ross
James E. Rothman
Daniel V. Santi
Thomas C. Schelling
Ronald H. Schwartz
Vernon L. Smith
Otto T. Solbrig
Robert T. N. Tjian
Virginia Trimble
Geerat J. Vermeij
Harold Weintraub
Irving L. Weissman
George M. Whitesides
Owen N. Witte
William B. Wood

American Association for the Advancement of Science
Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Publisher: Alvin W. Trivelpiece

Editor: Daniel E. Koshland, Jr.

Deputy Editors: Philip H. Abelson (*Engineering and Applied Sciences*); John I. Brauman (*Physical Sciences*)

EDITORIAL STAFF

Managing Editor: Patricia A. Morgan

Assistant Managing Editor: Nancy J. Hartnagel

Senior Editors: Eleanore Butz, Ruth Kulstad

Associate Editors: Martha Coleman, R. Brooks Hanson, Barbara Jasny, Katrina L. Kelner, Edith Meyers, Linda J. Miller, Phillip D. Szuromi, David F. Voss

Letters Editor: Christine Gilbert

Book Reviews: Katherine Livingston, *editor*; Deborah F. Washburn

This Week in Science: Ruth Levy Guyer

Contributing Editor: Lawrence I. Grossman

Chief Production Editor: Ellen E. Murphy

Editing Department: Lois Schmitt, *head*; Mary McDaniel,

Patricia L. Moe, Barbara E. Patterson

Copy Desk: Joi S. Granger, Beverly Shields, Anna Victoreen, Barbara Wittig

Production Manager: Karen Schools

Assistant Production Manager: James Landry

Graphics and Production: Holly Bishop, James J. Olivarri, Yolanda M. Rook

Covers Editor: Grayce Finger

Manuscript Systems Analyst: William Carter

NEWS STAFF

News Editor: Barbara J. Culliton

News and Comment: Colin Norman, *deputy editor*; William Booth, Gregory Byrne, Mark H. Crawford, Constance Holden, Eliot Marshall, Marjorie Sun, John Walsh

Research News: Roger Lewin, *deputy editor*; Deborah M. Bames, Richard A. Kerr, Jean L. Marx, Leslie Roberts, M. Mitchell Waldrop

European Correspondent: David Dickson

BUSINESS STAFF

Business Staff Manager: Deborah Rivera-Wienhold

Classified Advertising Supervisor: Karen Morgenstern

Membership Recruitment: Gwendolyn Huddle

Member and Subscription Records: Ann Ragland

Guide to Biotechnology Products and Instruments: Shauna S. Roberts

ADVERTISING REPRESENTATIVES

Director: Earl J. Scherago

Traffic Manager: Donna Rivera

Traffic Manager (Recruitment): Gwen Canter

Advertising Sales Manager: Richard L. Charles

Employment Sales Manager: Edward C. Keller

Marketing Manager: Herbert L. Burklund

Sales: New York, NY 10036: J. Kevin Henebry, 1515 Broadway (212-730-1050); Scotch Plains, NJ 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); Chicago, IL 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-337-4973); San Jose, CA 95112: Bob Brindley, 310-S. 16 St. (408-998-4690); Dorset, VT 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581); Damascus, MD 20872: Rick Sommer, 24808 Shrubbery Hill Ct. (301-972-9270); U.K., Europe: Nick Jones, +44(0647)52918; Telex 42513; FAX (0392) 31645.

Information for contributors appears on page XI of the 25 March 1988 issue. Editorial correspondence, including requests for permission to reprint and reprint orders, should be sent to 1333 H Street, NW, Washington, DC 20005. Telephone: 202-326-6500.

Advertising correspondence should be sent to Tenth Floor, 1515 Broadway, NY 10036. Telephone 212-730-1050 or WU Telex 968082 SCHERAGO.

Random Samples

Einstein once said, "Science can progress on the basis of error as long as it is not trivial." Farraday was once asked by a colleague, "Is Professor X always wrong?" "He's not that consistent," replied Farraday. Once when Philip Handler was chairman of the National Science Board and was defending the budget of the National Science Foundation, a hostile senator said, "I hear you biochemists want to adulterate bread by adding vitamin B to it. If the good Lord had wanted vitamin B in bread he would have put it there." Handler responded, "The good Lord did put vitamin B in bread. It was man who took it out in order to make white bread. The scientists who want to put it back are doing God's work." The NSF appropriation passed.

These vignettes are not the hard stuff of new scientific experiments or theories on which major scientific progress is based, but they are vignettes illustrating the processes and illuminating the people who create it. In this issue of *Science* we introduce a new feature in which incidents similar to those described above will be recorded (see page 1279). It will include testimony before Congress, quotations of scientists and of nonscientists about science, philosophical observations, and historical events. It is intended, like stroboscopic flashes, to highlight the insight and amusement that become visible transiently in the onward march of science. This column will be researched and written by Gregory Byrne, who will welcome your contributions.

One particular type of contribution will satisfy two needs. *Science* is deluged with requests to report prizes, obituaries, and promotions. We report little in this regard, not because the items are unimportant, but because to do a good job would require pages of sleep-inducing facts. Specialty journals can do this for one discipline, but *Science* covers the entire range of disciplines and there are innumerable prizes. If we wish to be fair to all disciplines, we would soon be swamped. However, anecdotes from award ceremonies frequently reveal little-known facts about how important discoveries were made or how scientific careers were formed. These and other amusing insights tell a great deal about the policies and history of science. *Science* readers should find that reporting of such information is worthy of space than a dry recital of the awards, promotions, and deaths. Those who provide us with interesting stories will be in the happy situation of giving our readers some ideas to ponder.

We have named the page "Random Samples." The dictionary defines "random" as "without definite aim, direction, rule or method, haphazard" and "sample" as "a part of anything shown as evidence of the quality of the whole." An individual anecdote is not evidence in science, and the items on this page will be collected with no large goal or message in mind. But often facts collected with one aim in mind can turn out to be useful in an unexpected connection. Space does not allow coverage of all the awards, all the testimony before Congress, or all the incidental items that occur each week. But if we are random enough, and our samples are representative, a picture of some of the fun and humanity of science may serendipitously emerge.

To believers in fairy tales, the good guys always win and the winners are always good guys. In the real world, including science, that is not always true. Some very important discoveries have been made by individuals whom one might not want to invite to dinner. And some extremely nice people just do not end up in the winner's circle. Character, however, is not irrelevant, since individuals who are generous with advice and materials to colleagues accelerate science by helping others, sometimes at sacrifice to their own advancement. The press is great at exposing unpleasant character flaws, but the person who is willing to play by the rules instead of cutting corners frequently gets short shrift. Scientists' attitudes, however, to new opportunities for inquiry, their insights into future directions of science, their eloquence in testimony before Congress, and their memories of how certain discoveries were made can provide insight, inspiration, or warning to others who are practitioners of the art. In some cases they may affect the research effort of the scientist in the laboratory. In other cases they may provide an epigram that will be useful to those trying to communicate more effectively with the public. Felicity in language and novelty in ideas deserve recognition whenever they occur. Those who notice such events should send them to us so that others may also enjoy and profit from the experience.—

DANIEL E. KOSHLAND, JR.