

POLICY FORUM

Science Policy: The Candidates' Response 384

NEWS & COMMENT

Searching for Markers on the AIDS Trail 388
Exploring Other Surrogate Markers

Dustup in the Bone Pile: Academics v. Collectors 391

Peering Through a Lens, Sharply 393

Who's Who Among Science Advisers 393

Study Casts Doubt on Hiroshima Data 394

NASA Urged to Pump Up Its First 'A' 394

Pinatubo Fails to Deepen the Ozone Hole 395

RESEARCH NEWS

Mortality: Overturning Received Wisdom 398

Chemists Cluster in Chicago to Confer on Cagey Compounds 400

An Everyman's Free-Electron Laser? 401

Dictyostelium Researchers Expect Gene Bonanza 402

Earth Gains a Retinue of Mini-Asteroids 403

PERSPECTIVE

New Ideas for Guiding the Evolution of a Quantum System 412
S. A. Rice

ARTICLES

Macroscopic Quantum Effects in Nanometer-Scale Magnets 414
D. D. Awschalom, D. P. DiVincenzo, J. F. Smyth

The Age and Size of the Universe 421
S. van den Bergh

E2F: A Link Between the Rb Tumor Suppressor Protein and Viral Oncoproteins 424
J. R. Nevins

RESEARCH ARTICLES

An Instability in Neutron Stars at Birth 430
A. Burrows and B. A. Fryxel

DEPARTMENTS

THIS WEEK IN SCIENCE 377

EDITORIAL 379
Concerning the Future of the NSF
F. Albert Cotton

LETTERS 381
Understanding Chemistry: H. D. Thier • Use of Animal Drugs: G. B. Guest • Hydrogen Bonding: B. C. Faust; G. A. Blake • Carbon Budget Estimates: E. B. Rastetter and R. A. Houghton; P. E. Kauppi, K. Mielikäinen, K. Kuusela

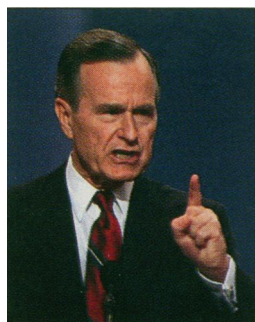
SCIENCESCOPE 387

RANDOM SAMPLES 396

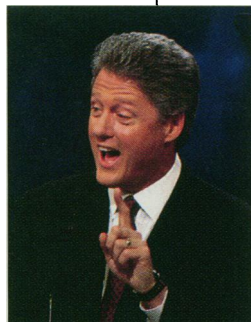
AAAS MEETING SEMINAR 408

BOOK REVIEWS 487
The Creationists, reviewed by J. D. Hoeveler • *The Disability Business*, E. Berkowitz • *Dirt and Disease*, R. D. Apple • Books Received

PRODUCTS & MATERIALS 494



Bush and Clinton address *Science* questions



384



398, 457 & 461

Aging flies and models of mortality

AAAS Board of Directors

Leon M. Lederman
Retiring President, Chairman
F. Sherwood Rowland
President
Eloise E. Clark
President-elect
Mary Ellen Avery
Francisco J. Ayala
Robert A. Frosch

Florence P. Haseltine
Alan Schriesheim
Jean'ne M. Shreeve
Chang-Lin Tien
Warren M. Washington

William T. Golden
Treasurer
Richard S. Nicholson
Executive Officer

John Abelson
Frederick W. Alt
Don L. Anderson
Stephen J. Benkovic
David E. Bloom
Floyd E. Bloom
Henry R. Bourne
James J. Bull
Kathryn Calame
C. Thomas Caskey
Dennis W. Choi

John M. Coffin
Bruce F. Eldridge
Paul T. Englund
Richard G. Fairbanks
Douglas T. Fearon
Harry A. Fozzard
Victor R. Fuchs
Theodore H. Geballe
Margaret J. Geller
John C. Gerhart
Roger I. M. Glass

Stephen P. Goff
Corey S. Goodman
Stephen J. Gould
Ira Herskowitz
Eric F. Johnson
Stephen M. Kosslyn
Michael LaBarbera
Charles S. Levings III
Harvey F. Lodish
Richard Losick
Anthony R. Means

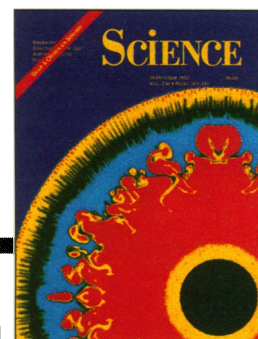
Mortimer Mishkin
Roger A. Nicoll
William H. Orme-Johnson III
Stuart L. Pimm
Yeshayau Pocker
Dennis A. Powers
Ralph S. Quatrano
V. Ramanathan
Douglas C Rees
Erkki Ruoslahti
Ronald H. Schwartz

Terrence J. Sejnowski
Thomas A. Steitz
Richard F. Thompson
Robert T. N. Tjian
Emil R. Unanue
Geerat J. Vermeij
Bert Vogelstein
Harold Weintraub
Zena Werb
George M. Whitesides
Owen N. Witte
Keith Yamamoto

Board of Reviewing Editors

Representation of the entropy distribution in a nascent neutron star about 20 milliseconds after the collapsing core of its parent star stiffens and bounces. The shocked region experiences hydrodynamic instabilities that violate spherical symmetry and that may be central to the eventual understanding of supernovae and pulsars.

See page 430. The entropy values span the spectrum from purple through blue and red, with the highest values represented by red; the black core shows the inner dense stable region. [Image: Adam Burrows and Bruce A. Fryxell]



Atomic Structure of the DNA Repair [4Fe-4S] Enzyme Endonuclease III 434
C.-F. Kuo, D. E. McRee, C. L. Fisher, S. F. O'Handley, R. P. Cunningham, J. A. Tainer

REPORTS

Polymerization-Induced Epitaxy: Scanning Tunneling Microscopy of a Hydrogen-Bonded Sheet of Polyamide on Graphite 441
M. Sano, D. Y. Sasaki, T. Kunitake

Small-Angle Synchrotron X-ray Scattering Reveals Distinct Shape Changes of the Myosin Head During Hydrolysis of ATP 443
K. Wakabayashi, M. Tokunaga, I. Kohno, Y. Sugimoto, T. Hamanaka, Y. Takezawa, T. Wakabayashi, Y. Amemiya

Neural Computing in Cancer Drug Development: Predicting Mechanism of Action 447
J. N. Weinstein, K. W. Kohn, M. R. Grever, V. N. Viswanadhan, L. V. Rubinstein, A. P. Monks, D. A. Scudiero, L. Welch, A. D. Koutsoukos *et al.*

Age and Duration of Weathering by ^{40}K - ^{40}Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ Analysis of Potassium-Manganese Oxides 451
P. M. Vasconcelos, T. A. Becker, P. R. Renne, G. H. Brimhall

Some Anthropological Aspects of the Prehistoric Tyrolean Ice Man 455
H. Seidler, W. Bernhard, M. Teschler-Nicola, W. Platzer, D. zur Nedden, R. Henn, A. Oberhauser, T. Sjøvold

Slowing of Mortality Rates at Older Ages in Large Medfly Cohorts 457
J. R. Carey, P. Liedo, D. Orozco, J. W. Vaupel

Demography of Genotypes: Failure of the Limited Life-Span Paradigm in *Drosophila melanogaster* 461
J. W. Curtsinger, H. H. Fukui, D. R. Townsend, J. W. Vaupel

Absorption Spectra of the Hybrid Pigments Responsible for Anomalous Color Vision 464
S. L. Merbs and J. Nathans

Isomerase and Chaperone Activity of Prolyl Isomerase in the Folding of Carbonic Anhydrase 466
P.-O. Freskgård, N. Bergenhem, B.-H. Jonsson, M. Svensson, U. Carlsson

Spontaneous Hypercholesterolemia and Arterial Lesions in Mice Lacking Apolipoprotein E 468
S. H. Zhang, R. L. Reddick, J. A. Piedrahita, N. Maeda

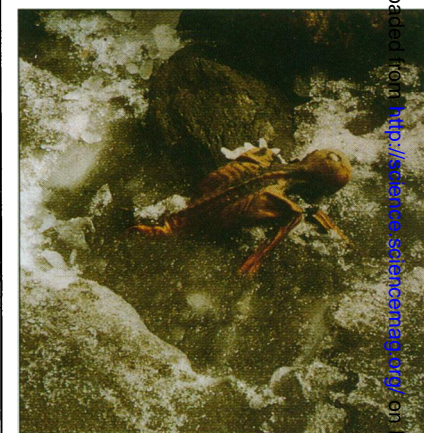
Formation of a Gated Channel by a Ligand-Specific Transport Protein in the Bacterial Outer Membrane 471
J. M. Rutz, J. Liu, J. A. Lyons, J. Goranson, S. K. Armstrong, M. A. McIntosh, J. B. Feix, P. E. Klebba

DNA Polymerase β and DNA Synthesis in *Xenopus* Oocytes and in a Nuclear Extract 475
T. M. Jenkins, J. K. Saxena, A. Kumar, S. H. Wilson, E. J. Ackerman

The Primary Structure of MEK, a Protein Kinase That Phosphorylates the ERK Gene Product 478
C. M. Crews, A. Alessandrini, R. L. Erikson

Removal of Nonhomologous DNA Ends in Double-Strand Break Recombination: The Role of the Yeast Ultraviolet Repair Gene RAD 1 480
J. Fishman-Lobell and J. E. Haber

Interaction of the Immunosuppressant Deoxyspergualin with a Member of the Hsp70 Family of Heat Shock Proteins 484
S. G. Nadler, M. A. Tepper, B. Schacter, C. E. Mazzucco



455 Frozen in time

■ Indicates accompanying feature

■ **SCIENCE** (ISSN 0036-8075) is published weekly on Friday, except the last week in December, 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 additional mailing offices. Copyright © 1992 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): \$87 (\$47 allocated to subscription). Domestic institutional subscription (51 issues): \$195. Foreign postage extra: Mexico, Caribbean (surface mail) \$50; other countries (air assist delivery) \$95. First class, airmail, student and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. **Change of address:** allow 6 weeks, giving old and new addresses and 11-digit account number. **Postmaster:** Send change of address to *Science*, P.O. Box 2033, Marion, OH 43305-2033. **Single copy sales:** \$6.00 per issue prepaid includes surface postage; Guide to Biotechnology Products and Instruments, \$20.

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, MA 01970. The identification code for *Science* is 0036-8075/83 \$1 + .10. *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.

Science

258 (5081)

Science **258** (5081), 377-494.

ARTICLE TOOLS

<http://science.sciencemag.org/content/258/5081>

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 © 1992 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.