

1307 This Week in *Science*

Editorial

1309 Scienceless to Homeless: R. J. WYATT AND E. G. DeRENZO

Letters

1311 Species Loss: B. D. PATTERSON; M. A. MARES ■ Peace and Virtue:
B. T. WERNER

News & Comment

1313 Omnibus Health Bill: Vaccines, Drug Exports, Physician Peer Review

1315 Europe Struggles to Control Pollution

1316 Prospects Discouraging for Minorities in Science

1317 Interior Sets Fight on Alaska Oil Patch

Briefing: U.K. Research Jobs Down ■ Forest Conservation ■ Ariane Plans Next
Launch in March

1318 Biotech Firms Compete in Genetic Diagnosis

Research News

1321 Comets Appear to Be Rosetta Stones

1322 Synchrotron X-rays Probe Coronary Arteries

1324 Neurosciences Advance in Basic and Clinical Realms: A Possible Diagnostic Test
for Alzheimer's? ■ Ion Channels That May Underlie Learning ■
Neurotransmitters Regulate Growth Cones

1326 A New Look at an Old Fossil Face

Articles

1349 Research Toward Malaria Vaccines: L. H. MILLER, R. J. HOWARD, R. CARTER,
M. F. GOOD, V. NUSSENZWEIG, R. S. NUSSENZWEIG

1356 Randomly Exact Methods: J. D. DOLL AND D. L. FREEMAN

1361 Social Relationships and Social Cognition in Nonhuman Primates: D. CHENEY,
R. SEYFARTH, B. SMUTS

Research Articles

1366 A Deletion Truncating the Gonadotropin-Releasing Hormone Gene Is
Responsible for Hypogonadism in the *hpg* Mouse: A. J. MASON, J. S. HAYFLICK,
R. T. ZOELLER, W. S. YOUNG III, H. S. PHILLIPS, K. NIKOLICS, P. H. SEEBURG

1372 The Hypogonadal Mouse: Reproductive Functions Restored by Gene Therapy:
A. J. MASON, S. L. PITTS, K. NIKOLICS, E. SZONYI, J. N. WILCOX,
P. H. SEEBURG, T. A. STEWART

Reports

1379 The Color of the Surface of Venus: C. M. PIETERS, J. W. HEAD, W. PATTERSON,
S. PRATT, J. GARVIN, V. L. BARSUKOV, A. T. BASILEVSKY, I. L. KHODAKOVSKY,
A. S. SELIVANOV, A. S. PANFILOV, Y. M. GEKTIK, Y. M. NARAYEVA

1383 Climatic Consequences of Very High Carbon Dioxide Levels in Earth's Early
Atmosphere: J. F. KASTING AND T. P. ACKERMAN

1385 Ultraviolet Irradiation Transforms C3H10T1/2 Cells to a Unique, Suppressible
Phenotype: H. R. HERSCHMAN AND D. W. BRANKOW

■ 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 © 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 \$32, 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 Chicago, Illinois, site of AAAS Annual Meeting, 14 to 18 February 1987. John David Mooney's "Light Space 77," a seven-night performance sculpture, consisted of 16 carbon-arc searchlights, whose precise, timed movements through their radial and azimuth positions were executed according to visual scores written by the artist. These 6-mile-high beams, emanating both from barges and sites along 8 miles of Chicago's shoreline, created an ephemeral counterpoint to the city's skyscrapers as the first environmental public sculpture ever commissioned by the City of Chicago from a living artist. See page 1429. [© Mooney 1977; photograph by Barbara Jones, Chicago, IL]

- 1388 Inhibition of Secretion of Hepatitis B Surface Antigen by a Related Presurface Polypeptide: D. H. PERSING, H. E. VARMUS, D. GANEM
- 1392 HTLV-III/LAV-Neutralizing Antibodies to an *E. coli*-Produced Fragment of the Virus Envelope: S. D. PUTNEY, T. J. MATTHEWS, W. G. ROBAY, D. L. LYNN, M. ROBERT-GUROFF, W. T. MUELLER, A. J. LANGLOIS, J. GHAYEB *et al.*
- 1395 Oligodendrocyte Adhesion Activates Protein Kinase C-Mediated Phosphorylation of Myelin Basic Protein: T. VARTANIAN, S. SZUCHET, G. DAWSON, A. T. CAMPAGNONI
- 1398 The Nucleocapsid of Hepatitis B Virus Is Both a T-Cell-Independent and a T-Cell-Dependent Antigen: D. R. MILICH AND A. MCLACHLAN
- 1401 Characterization of T Cell Receptor Gamma Chain Expression in a Subset of Murine Thymocytes: A. M. LEW, D. M. PARDOLL, W. L. MALOY, B. J. FOWLKES, A. KRUISBEEK, S.-F. CHENG, R. N. GERMAIN *et al.*
- 1405 Determination of Junction Avidity of Cytolytic T Cell and Target Cell: K.-L. P. SUNG, L. A. SUNG, M. CRIMMINS, S. J. BURAKOFF, S. CHIEN
- 1409 Tissue-Specific and Ectopic Expression of Genes Introduced into Transgenic Mice by Retroviruses: P. SORIANO, R. D. CONE, R. C. MULLIGAN, R. JAENISCH
- 1413 Physical Theory of the Orientation of Astral Mitotic Spindles: M. BJERKNES
- 1417 The Fos Protein Complex Is Associated with DNA in Isolated Nuclei and Binds to DNA Cellulose: L. C. SAMBUCETTI AND T. CURRAN
- 1419 Tumor Necrosis Factor Reduces *c-myc* Expression and Cooperates with Interferon- γ in HeLa Cells: A. YARDEN AND A. KIMCHI

Technical Comments

- 1422 Role of Phycoerythrin in Marine Picoplankton *Synechococcus* spp.: S. W. YEH, L. J. ONG, A. N. GLAZER; M. WYMAN, R. P. F. GREGORY, N. G. CARR ■ Magnetically Oriented Solutions: E. T. SAMULSKI; L. MAKOWSKI AND M. GLUCKSMAN

AAAS Meetings

- 1429 *Annual Meeting*: Preconvention Program ■ Tours ■ Meeting Information ■ Advance Registration Form

Book Reviews

- 1446 Technical Progress and Soviet Economic Development, *reviewed by* J. P. HARDT ■ Anger, C. N. DEGLER ■ Molecular Cell Biology, E. LAZARIDES ■ Galaxy Distances and Deviations from Universal Expansion, V. TRIMBLE ■ Reprints of Books Previously Reviewed ■ Books Received

Products & Materials

- 1450 Foot-Operated Microscope Focuser ■ Thermal Microscope Stage ■ Calculator Software for Personal Computers ■ Southern Genotyping Procedure System ■ Automatic Preparative Gas Chromatograph ■ Fluid Surface Tensiometer ■ Desktop Analysis Software

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 Lipsit
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. Pearse
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
Harold Weintraub
Irving L. Weissman
George M. Whitesides
Owen N. Witte
William B. Wood
Harriet Zuckerman

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: William D. Carey

Editor: Daniel E. Koshland, Jr.

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

EDITORIAL STAFF

Managing Editor: Patricia A. Morgan

Assistant Managing Editors: Nancy J. Hartnagel, John E. Ringle

Senior Editors: Eleanore Butz, Ruth Kulstad

Associate Editors: Martha Collins, Barbara Jasny, Katrina L. Kelner, Edith Meyers, Phillip D. Szuroni, David F. Voss

Letters Editor: Christine Gilbert

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

This Week in Science: Ruth Levy Guyer

Chief Production Editor: Ellen E. Murphy

Editing Department: Lois Schmitt, *head*; Caitlin Gordon, Mary McDaniel, Barbara E. Patterson

Copy Desk: Lyle L. Green, Sharon Ryan, Beverly Shields, Anna Victoreen

Production Manager: Karen Schools

Graphics and Production: John Baker, *assistant manager*; Holly Bishop, Kathleen Cosimano, Eleanor Warner

Covers Editor: Grayce Finger

Manuscript Systems Analyst: William Carter

NEWS STAFF

News Editor: Barbara J. Culliton

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

Research News: Roger Lewin, *deputy editor*; Deborah M. Barnes, Richard A. Kerr, Gina Kolata, Jean L. Marx, Arthur L. Robinson, M. Mitchell Waldrop

European Correspondent: David Dickson

BUSINESS STAFF

Associate Publisher: William M. Miller, III

Business Staff Manager: Deborah Rivera-Wienhold

Classified Advertising: Leo Lewis

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

Production Manager: Donna Rivera

Advertising Sales Manager: Richard L. Charles

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).

Instructions for contributors appears on page xi of the 26 September 1986 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.

Scienceless to Homeless

America's homeless crisis began in 1963 when deinstitutionalization became law through enactment of the Mental Retardation Facilities and Community Mental Health Centers Act. Hundreds of thousands of disabled patients with schizophrenia, affective disorders, alcoholism, and severe personality disorders were released from large institutions to the streets. Once deinstitutionalized, these individuals created their own communities of isolation, alienation, hopelessness, and despair. By law, the former residents of structured institutions became the homeless.

This situation occurred because a social welfare movement, based on virtually no scientifically gathered data, became public policy. Remarkably, only one controlled pilot study performed in England was available at the time the law was passed. The country undertook a noble, but unfeasible, and ultimately unjustifiable project because the essential research had not been done. Once the decision to deinstitutionalize was in place, a sense of urgency prevailed. Patients became caught on colliding tectonic plates, pushed and stretched in all directions by psychiatrists, unions, nurses, psychologists, and social workers. The legal system, legislators, and the media all thought they knew—or at least gave the impression that they knew—what was wrong with our mental health system. Few, however, were able or willing to provide the requisite care.

There is no reason to believe that our current concerns for the homeless, and our inadequately conceived solutions, will not create new problems. Again, inexplicably, there are essentially no controlled studies to show us how to handle the problem.

Designing well-controlled studies for evaluating community programs is difficult. Such studies do not fit into a traditional paradigm. It was not until last year that the first approximation of a controlled study of widespread community care was published.* Schizophrenic patients, after discharge from psychiatric hospitals, were followed in Vancouver, British Columbia, and Portland, Oregon, cities with decidedly different aftercare profiles: Vancouver has many aftercare facilities; Portland's are fewer, and they are less well staffed and coordinated. Schizophrenic patients in Vancouver had fewer relapses, a greater sense of well-being, and a higher degree of employment than those in Portland. Although there are problems with the study—it examined fewer than 60 people and those from Portland may have been more severely ill—it shows that such studies can be performed.

We must ameliorate the miseries of our homeless mentally ill. But in doing so we must not make the situation worse. Today, it is inconceivable that a new medication would be introduced before large-scale clinical trials were conducted among diverse patient populations. Furthermore, once the drug became widely available we would continue to monitor its effectiveness and potential toxicity. If the new medication turned out to be less effective or more toxic than originally thought, it would be removed from the market, or at least its usage would be narrowed. Controlled clinical trials of medications limit the risk to a few.

Why do we not have similar criteria for our social experiments? In the case of deinstitutionalization, no large-scale efficacy trials were performed. Toxicity and adverse consequences were not monitored. We are only now beginning to identify who the homeless mentally ill are. Well-designed and replicated controlled experiments are necessary. Without such studies we will repeat our mistakes. And we are certain to cause new, unforeseeable hardships. Before we prematurely institute new public policies, we should collect the necessary data to rationally initiate social welfare system changes. By calling for careful studies, we do not advocate inaction until all the answers are known; we must deal with today's difficulties today. But unless we invest time, energy, money, and our good minds toward a solution, today's problem will remain for tomorrow.—RICHARD JED WYATT, *Chief, Neuropsychiatry Branch, National Institute of Mental Health, and Intramural Research Program at St. Elizabeths Hospital, Washington, DC 20032*; EVAN G. DERENZO, *director of admissions, Collingswood Nursing Center, Rockville, MD 20850*

*M. Beiser, J. H. Shore, R. Peters, E. Tatum, *Am. J. Psychiatry* 142, 1047 (1985).