

AMERICAN
ASSOCIATION FOR THE
ADVANCEMENT OF
SCIENCE

SCIENCE

5 FEBRUARY 1988

\$3.00

VOL. 239 ■ PAGES 533-696

Programs for the prevention and control of AIDS should be an immediate priority in



all countries. AIDS is already among the most costly diseases.

Effective education will lead to changes in behavior. The testing of vaccines will raise ethical issues. Legal protection against the spread...



NEW GP SERIES CENTRIFUGES: UNDER, OVER, AND BEYOND!



Presenting the space-saving GP Series from Beckman, with models that fit under as well as on top of a lab bench and provide capabilities beyond those of other general purpose centrifuges.

For high reliability and quality separations, the GP's have a Beckman-designed drive, automatic "soft-start" and two-stage disc brake. These quiet-running centrifuges are available with or without refrigeration.

For fast separations, the horizontal rotor—of corrosion resistant stainless steel—spins 3 Liters at 3750 rpm/3200 *g*. You can spin microplates, blood bag cups, aerosol cannisters, even 250-mL conical-tip plastic bottles. Modular disk adapters accommodate every



popular size tube—as many as 56 15-mL tubes, for example.

There also are two fixed angle rotors—10 x 50-mL and 24 x 15-mL—rated for 6400 rpm/5642 *g*.

The new GP's—under, over, beyond. *And at a great price!* In the USA, available through your local VWR Scientific office and Beckman Instruments, Inc., Spinco Division, 1050 Page Mill Road, Palo Alto, CA 94304. Offices worldwide.

BECKMAN

A SMITHKLINE BECKMAN COMPANY

Circle No. 148 on Readers' Service Card

1988

Hot Off the Press!

THEY'RE HERE! THEY'RE ABSOLUTELY FREE!

OMEGA's **9** New Complete Handbooks & Encyclopedias



- ✓ **TEMPERATURE**—872 pages
- ✓ **PRESSURE**—368 pages
- ✓ **FLOW**—304 pages
- ✓ **pH**—168 pages
- ✓ **DATA ACQUISITION**—352 pages
- ✓ **BOOK OF DISCOUNT SOFTWARE**—400 pages
- ✓ **BOOK OF BOOKS**—1,300 pages
- ✓ **TEST INSTRUMENTATION & TOOLS**—136 pages
- ✓ **ELECTRIC HEATERS**—200 pages

Circle the reader service number to receive your free Handbook Qualification form.



One Omega Drive, Box 4047, Stamford, CT 06907
Telex 996404 Cable OMEGA FAX (203) 359-7700

In a Rush For Your FREE Handbooks?

**DIAL (203) 359-RUSH
(203) 359-7874**

© COPYRIGHT 1987, OMEGA ENGINEERING, INC. PRINTED IN USA
Circle No. 147 on Readers' Service Card



539 This Week in *Science*

Editorial

541 The AIDS Issue

Letters

543 Child Care Dilemma: N. RATNER; L. GAINES; D. E. HENDERSON AND S. K. HENDERSON; H. MORAWETZ ■ Radar Systems: D. K. STUMPF; S. BUDIANSKY ■ Rinderpest Campaign in Africa: W. N. MASIGA ■ ABM Treaty: M. GOODMAN

News & Comment

551 Politics and Soviet Psychiatry
554 Perot to Fund Scientist-Physicians
August Shuttle Launch Set
555 Space Policy: No Lift-Off
Manned Spaceflight Fails Peer Review
556 Doctored Report Revives Debate on 1957 Mishap
557 Science Lobbying Groups Formed
558 *Briefing*: Biting the Bullet ■ Academy/IOM Name AIDS Panel ■ Koop Floats a Plan; CDC Not Impressed ■ AIDS Pamphlet to Be Mailed

Research News

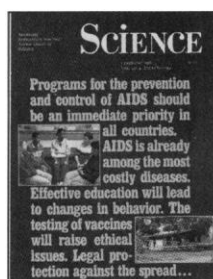
559 Is the Greenhouse Here?
561 Molecular Clocks Turn a Quarter Century: Origins and Evolution of the Molecular Clock ■ Of Apes, Men, and Statistical Analysis ■ How to Perturb a Regular Clock ■ Evidence for a Universal Rate of Mutation
563 Recount on Amazon Trees
564 Questions Raised About Anti-Wrinkle Cream

Articles

AIDS

573 AIDS: An International Perspective: P. PIOT, F. A. PLUMMER, F. S. MHALU, J.-L. LAMBORAY, J. CHIN, J. M. MANN
580 Legal Rights and Duties in the AIDS Epidemic: B. M. DICKENS
586 The Brain in AIDS: Central Nervous System HIV-1 Infection and AIDS Dementia Complex: R. W. PRICE, B. BREW, J. SIDTIS, M. ROSENBLUM, A. C. SCHECK, P. CLEARY
592 Education to Prevent AIDS: Prospects and Obstacles: H. V. FINEBERG
597 Ethical Issues in the Prevention and Treatment of HIV Infection and AIDS: L. WALTERS
604 The Economic Impact of AIDS in the United States: D. E. BLOOM AND G. CARLINER
610 Epidemiology of HIV Infection and AIDS in the United States: J. W. CURRAN, H. W. JAFFE, A. M. HARDY, W. M. MORGAN, R. M. SELIK, T. J. DONDERO
617 The Human Immunodeficiency Virus: Infectivity and Mechanisms of Pathogenesis: A. S. FAUCI

- **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): \$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 \$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 Manifestations of concern with AIDS, the acquired immunodeficiency syndrome, in the United States: children receiving instruction on AIDS prevention in the classroom and the burned-out house of a family with AIDS-infected children. This issue of *Science* includes articles on the epidemiological, legal, economic, and ethical issues of AIDS. See page 573. [Cover design by Sharon Wolfgang, Washington, DC; classroom scene, Mauro Calingo, Silver Spring, MD; and house, Marc Beaudin, *News-Press*, Fort Myers, FL]

Reports

- 623 Growth of Thin Chemically Bonded Diamondlike Films by Ion Beam Deposition: J. W. RABALAIS AND S. KASI
- 625 IRAS 14348–1447, an Ultraluminous Pair of Colliding, Gas-Rich Galaxies: The Birth of a Quasar?: D. B. SANDERS, N. Z. SCOVILLE, B. T. SOIFER
- 628 Signal Transduction Through the EGF Receptor Transfected in IL-3–Dependent Hematopoietic Cells: J. H. PIERCE, M. RUGGIERO, T. P. FLEMING, P. P. DI FIORE, J. S. GREENBERGER, L. VARTICOVSKI, J. SCHLESSINGER *et al.*
- 631 Replacements of Pro⁸⁶ in Phage T4 Lysozyme Extend an α -Helix But Do Not Alter Protein Stability: T. ALBER, J. A. BELL, S. DAO-PIN, H. NICHOLSON, J. A. WOZNAK, S. COOK, B. W. MATTHEWS
- 635 Labeling of Neural Cells by Gold-Filled Sendai Virus Envelopes Before Intracerebral Transplantation: S. C. ARDIZZONI, A. MICHAELS, G. W. ARENDASH
- 637 Cells Process Exogenous Proteins for Recognition by Cytotoxic T Lymphocytes: J. W. YEWDELL, J. R. BENNINK, Y. HOSAKA
- 640 Mitogenesis in Response to PDGF and Bombesin Abolished by Microinjection of Antibody to PIP₂: K. MATUOKA, K. FUKAMI, O. NAKANISHI, S. KAWAI, T. TAKENAWA
- 643 Cell-Cell Interactions in the Guidance of Late-Developing Neurons in *Caenorhabditis elegans*: W. W. WALTHALL AND MARTIN CHALFIE
- 645 The *ras* Oncogenes Increase the Intrinsic Resistance of NIH 3T3 Cells to Ionizing Radiation: M. D. SKLAR

Technical Comments

- 648 Is Ethanol Antagonist Ro15-4513 Selective for Ethanol?: K. T. BRITTON, C. L. EHLERS, G. F. KOOB; P. D. SUZDAK, J. R. GLOWA, J. N. CRAWLEY, P. SKOLNICK, S. M. PAUL

AAAS News

- 651 Annual Meeting Returns to Boston: J. WRATHER ■ More Museum Benefits Announced: M. ZENDELL ■ Entries Asked for Behavioral Science Research Prize ■ Amendment to AAAS Constitution Adopted ■ Nomination of AAAS Fellows Invited ■ Pacific Division to Meet in Corvallis in June ■ Participation of Women and Minorities in Science on Decline: B. M. VETTER ■ Soviet Scientists to Speak at Annual Meeting ■ AAAS Radio Program on Mutual

Book Reviews

- 656 Academics in Court, *reviewed by* M. G. YUDOF ■ From Mineralogy to Geology, J. A. SECORD ■ Observational Cosmology, S. WHITE ■ Global Bio-Events, K. W. FLESSA ■ Some Other Books of Interest ■ Books Received

Products & Materials

- 663 Peptide Synthesis Software ■ Peptide Separation Without Chromatography ■ Ready-to-Use Electrophoresis Gel Solution ■ Immunostaining System ■ Scientific Calculator ■ Instant Photos from Video Images ■ Liquid Scintillation Counter ■ Sound-Analysis Workstation ■ Data Acquisition Peripheral ■ Literature

Board of Directors

Lawrence Bogorad
*Retiring President,
Chairman*

Sheila E. Widnall
President

Walter E. Massey
President-elect

Robert McC. Adams
Floyd E. Bloom
Mary E. Clutter
Mildred S. Dresselhaus
Beatrix A. Hamburg
Donald N. Langenberg
Frank von Hippel
Linda S. Wilson

William T. Golden
Treasurer

Alvin W. Trivelpiece
Executive Officer

Editorial Board

Elizabeth E. Bailey
David Baltimore
William F. Brinkman
Philip E. Converse
Joseph L. Goldstein
F. Clark Howell
James D. Idol, Jr.
Leon Knopoff
Oliver E. Nelson
David M. Raup
Howard A. Schneiderman
Larry L. Smarr
Robert M. Solow
James D. Watson

Board of Reviewing Editors

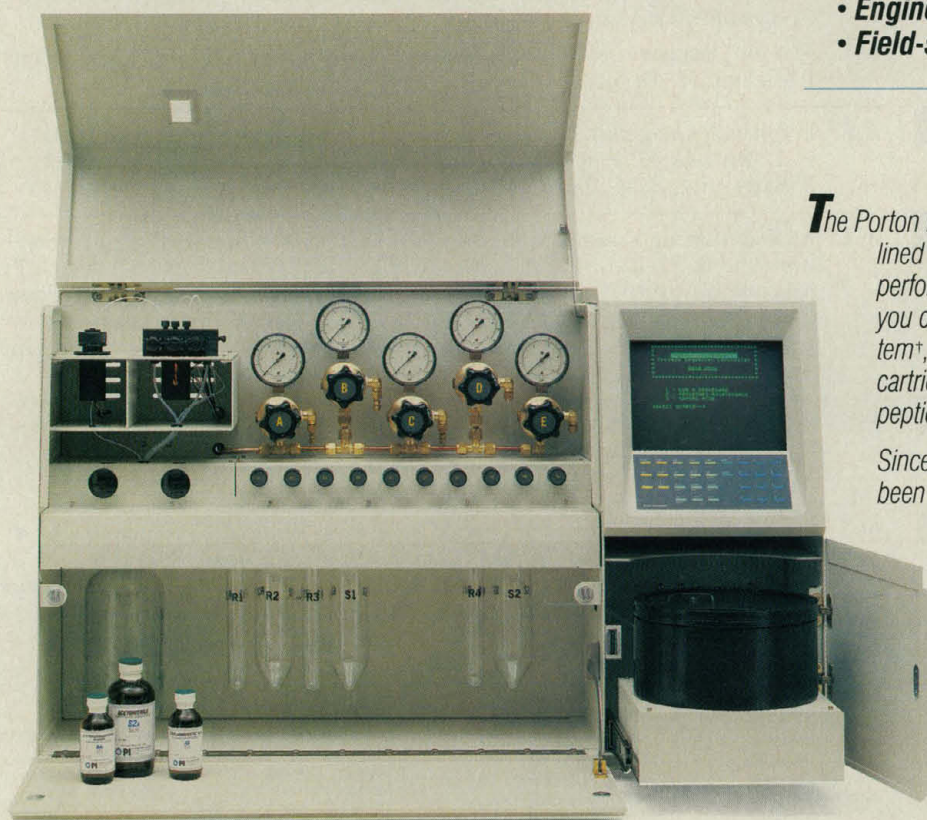
John Abelson
Qais Al-Awqati
Don L. Anderson
Stephen J. Benkovic
Floyd E. Bloom
James J. Bull
Charles R. Cantor
Ralph J. Cicerone
John M. Coffin
Bruce F. Eldridge
Paul T. Englund
Theodore H. Geballe
Roger I. M. Glass

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
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
Jean Paul Revel
James E. Rothman
Daniel V. Santi
Thomas C. Schelling
Ronald H. Schwartz
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

WE'VE RAISED SEQUENCING TO NEW LOWS:

...SO YOU CAN REACH NEW HEIGHTS:



Circle No. 103 on Readers' Service Card

*Polybrene® is a registered trademark of Abbott Laboratories
†Patents pending. © 1988 Porton Instruments

Lower capital investment

Lower operating expense

Lower set-up time

Lower maintenance

Higher efficiency

- Easy sample loading
- No Polybrene* or pre-cycling required
- Rapid software editing even during a run
- Power-fail recovery system

Higher productivity

- Easy operation even for first-time users
- Engineered for greater reliability
- Field-serviceable for less downtime

The Porton Protein Sequencer is designed for streamlined gas-phase operation, providing exceptional performance, reliability and sensitivity at a price you can afford. Our integrated fluid delivery system†, sample support† and self-sealing reaction cartridge† simplify the process of protein and peptide micro-sequencing.

Since 1942, the Porton International Group has been committed to providing technologically advanced products — such as the Porton Protein Sequencer — backed by quality service and technical support to the biotechnology community.

For more information about the Porton Protein Sequencer, call us toll-free at 1-800-822-6333.



**THE PORTON
PROTEIN
SEQUENCER**

PORTON INSTRUMENTS
5445 Balboa Boulevard, Suite 115
Encino, California 91316 U.S.A.
(818) 995-2471 or 1-800-822-6333
**BIOTECHNOLOGY COMPUTER
SYSTEMS LIMITED**
United Kingdom
(44) 01-995-3625

Stop by and see us at booth numbers 51-52-53 at the Miami Biotechnology Symposium

This Week in SCIENCE

Effective AIDS education

OF the approximately 50,000 reported victims of AIDS in the United States, about half have died, and no one has been cured (page 592). These and other figures and facts about AIDS and its transmission have been widely disseminated and even assimilated yet have not apparently impressed people enough to alter behavior in most at-risk populations. Many factors have contributed to this failure. For example, the public has received mixed, confusing messages from authorities: they have been told both that the virus can be isolated from saliva and that there is no evidence that AIDS can be contracted through kissing. Conflicts also arise from the clash of pragmatism and morality: drug users can reduce their risks by using clean needles, but, because drug use is illicit and illegal, needle-exchange programs have been unpopular. Fineberg discusses these and other obstacles to effective education and concludes that a well-coordinated, comprehensive approach to education remains to be organized in the United States. With such a program, which necessarily would incorporate attitudinal and behavioral changes for both individuals and society, success in stopping the spread of AIDS will not be assured, but, without it, success is unlikely. Seven more articles and Koshland's editorial highlight other aspects of the epidemic in this issue (pages 573 to 617 and page 541).

Diamond films

HARDNESS, strength, low-electric and high-thermal conductivity are features of diamondlike films (page 623). Rabalais and Kasi describe a new reproducible technique for depositing diamondlike films onto gold, tungsten, silicon, and other substrate surfaces. A carbon ion beam was directed onto an atomically clean surface in an ultrahigh vacuum chamber. The effective beam was at low energy, favoring a diamond over a graphite form of carbon deposition; initially a

carbide monolayer formed, but, with additional deposition, the film grew in a diamondlike structure. Preparation of electric-insulating and heat-conducting films and doped semiconducting films are expected to be among the important applications to result from this new technique.

Quasar

THE sequence of events that results in the birth of a quasar is believed to include violent collisions of molecular clouds in gas-rich spiral galaxies, a period of rapid star formation, formation of a dust-en-shrouded quasar, and finally the disappearance of the dust (it would be blown away by the combined pressure from stellar winds, supernovae explosions, and radiation pressure from the quasar) to reveal the underlying quasar (page 625). A candidate for a quasar in the dust-en-shrouded stage was detected in 1983 during a survey of the sky by the Infrared Astronomical Satellite; IRAS 14348-1447, the brightest and most distant object in the Bright Galaxy Survey, is sufficiently luminous to qualify as a quasar (a strongly emitting quasi-stellar object), and subsequent observations from the earth, described by Sanders *et al.*, support this classification. The strength of the luminosity of IRAS 14348-1447 suggests emissions from a pair of interacting galaxies rather than an isolated galaxy, which would have lower luminosity. The strong infrared emission (quasars have typically been detected through strong optical and ultraviolet emissions) is consistent with an infrared-emitting shroud of molecular gas brought in by colliding galaxies and concealing, until the dust blows off, much of the optical energy generated by the central quasar source.

Cells and viruses

NONINFECTIOUS influenza viruses can get inside cells, and, even though the virus does not replicate and new viral proteins are not

synthesized, the virus-containing cell can become a target for killing by a primed T lymphocyte (page 637). Inhibition of viral neuraminidase activity facilitates this process, probably by ensuring that much of the virus is available for processing by the target cells. (When neuraminidase is active, surface receptors for the virus may be inactivated.) Yewdell *et al.* show with a cultured cell line that, as long as the membrane of the influenza virus can fuse with the membrane of the target cell, the virus can be internalized; in the cytoplasm, the virus releases its ribonucleoprotein core, and virion proteins are then processed in a way that makes the host cell a target for killing. It is thus not necessary for a virus to be infectious in order for it to be recognized by killer T cells.

Radiation resistance and *ras* activation

CELLS in which a mutated *ras* oncogene is activated have greater intrinsic resistance to ionizing radiation than do their counterparts in which the oncogene has not been activated (page 645). Sklar found that the effect of the *ras* oncogene was independent of the malignant transformation process: revertant cells that had lost the transformed phenotype but in which *ras* remained activated retained resistance to radiation. Why the activated oncogene (whose protein product is in or near the cell membrane) enhances radiation resistance (a largely nuclear process) is unclear but of great interest because mammalian cells are increasingly being exposed to lethal ionizing radiation (environmental exposure or exposure during cancer therapy or diagnostic procedures). It may be possible to use information on *ras* activation to predict what human tumors will best be treated by radiation therapy and which ones will resist the effects of irradiation. And, if the mechanism by which *ras* activation enhances radiation resistance can be understood, it may even be possible to increase a tumor cell's sensitivity to ionizing radiation through activation of *ras*.

IT'S YOUR TIME

But you have only so much of it.

Reading every journal containing every paper relevant to your work is simply out of the question. Isn't it? Yet the need to know about current developments and the directions of future research is more pressing than ever.

The **ISI Atlas of Science** surveys the present research scene and looks into the future... in a format that's direct and easy to read.

A subscription to any of the sections shown below brings you four issues a year—each containing about 20 surveys by recognized experts, written **exclusively** for the ISI Atlas of Science. You'll find each collection of articles unrivaled in timeliness and editorial consistency.

So if time is the thing you can least afford to waste:

It's time to look at the ISI Atlas of Science.

Call and ask for a collection of free sample surveys!

ISI ATLAS OF SCIENCE® 1988



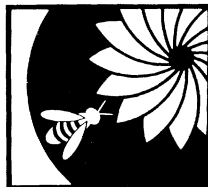
Atlas: Pharmacology. Experimental and clinical pharmacology, toxicology, carcinogenesis, mutagenesis, drug development, medicinal chemistry, pharmaceutical sciences



Atlas: Biochemistry. Biochemistry, molecular biology, microbiology, biophysics, molecular genetics, molecular physiology, other molecular level biological subjects



Atlas: Immunology. Immunology, cell biology, cell-cell interactions, developmental biology, developmental genetics



Atlas: Animal and Plant Sciences. Agricultural and veterinary sciences, anatomy, physiology, plant science, aquatic biology, ecology, reproductive biology, endocrinology, entomology, environmental science, evolution, population genetics

To find out more about the ISI Atlas of Science, call

1-800-523-1850

in the United States or Canada.

**ISI® Institute for
Scientific Information®**

3501 Market St., Philadelphia, PA 19104 U.S.A.

Tel: (215)386-0100, ext. 1405, Cable: SCINFO

Telex: 84-5305, Telecopier: (215)386-6362

European Branch:

132 High St., Uxbridge, Middlesex UB8 1DP,
United Kingdom

Tel: 44-895-70016, Telex: 933693 UKISI

29-5116

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: Eleanor Butz, Ruth Kulstad

Associate Editors: Martha Collins, R. Brooks Hanson, Barbara Jasny, Katrina L. Kelner, Edith Meyers, Phillip D. Szurmi, 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, 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. Olivari, 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*; William Booth, Mark H. Crawford, Diane Henry, Constance Holden, Eliot Marshall, Marjorie Sun, John Walsh

Research News: Roger Lewin, *deputy editor*; Deborah M. Barnes, 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. Burkland

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 18 December 1987 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.

The AIDS Issue

Plagues are identified with impoverished nations and past centuries, not with modern civilization. "It can't happen here, and it can't happen now" is the reaction of industrialized societies as a 20th-century epidemic of a fatal disease attacks their countries. The unthinkable is happening. In this issue of *Science*, put together with the help of many but especially senior editor Ruth Kulstad, a series of articles defines the enormity of the problem, making clear that any solution will demand scientific know-how, stark realism, and compassionate judgment.

The articles by Fauci, Price *et al.*, and Curran *et al.* establish some immediate boundaries. First, a long period of virus incubation before visible signs of the disease appear severely complicates efforts to contain the epidemic. The serious mental disturbances that arise in many cases add to the difficulties of coping with the disease. While the search for a cure goes on, the spread of the epidemic may be controlled to some extent by legal and educational approaches. The difficulty of educational persuasion is highlighted by Fineberg. Although education may already have convinced many of the groups at greatest risk of the facts, the drastic changes in behavior needed to modify statistics significantly have not occurred. Changing from 50 sexual partners to monogamy affects the probability of infection dramatically, but switching to five partners produces only marginal changes in risk. Drug users learn about the dangers of sharing needles but continue to share them. Knowledge does not guarantee motivation to change in the face of powerful biological urges.

The international aspects of the disease, reviewed by Piot *et al.*, deserve attention, because they throw light on the relation between different patterns of behavior and infection in different countries. For example, in Africa, heterosexual activity is the dominant mode of transmission whereas homosexual and drug-related activities continue to be important in transmission of the disease in the United States.

Legal and ethical problems that must be confronted are discussed by Dickens and by Walters. For instance, should testing be mandatory? Some emphatically say "No." But what is a hospital to do if a surgical patient refuses testing? There are obligations to employees as well as to patients. Should confidentiality be preserved at any cost? What is the responsibility of a physician in informing spouses and children, to say nothing of others who might become infected?

The incredible expense of existing AIDS cases and those predicted for the near future (estimated at \$22 billion for the United States by Bloom and Carliner in a conservative analysis) will certainly exacerbate the emotions of the debate. Is it the responsibility of society to pay the medical costs of those who are warned yet continue dangerous practices? Who is responsible for children who have contracted AIDS? For those who contract it from contaminated blood, who should be held responsible financially—hospitals, insurance companies, the government? Can they sue?

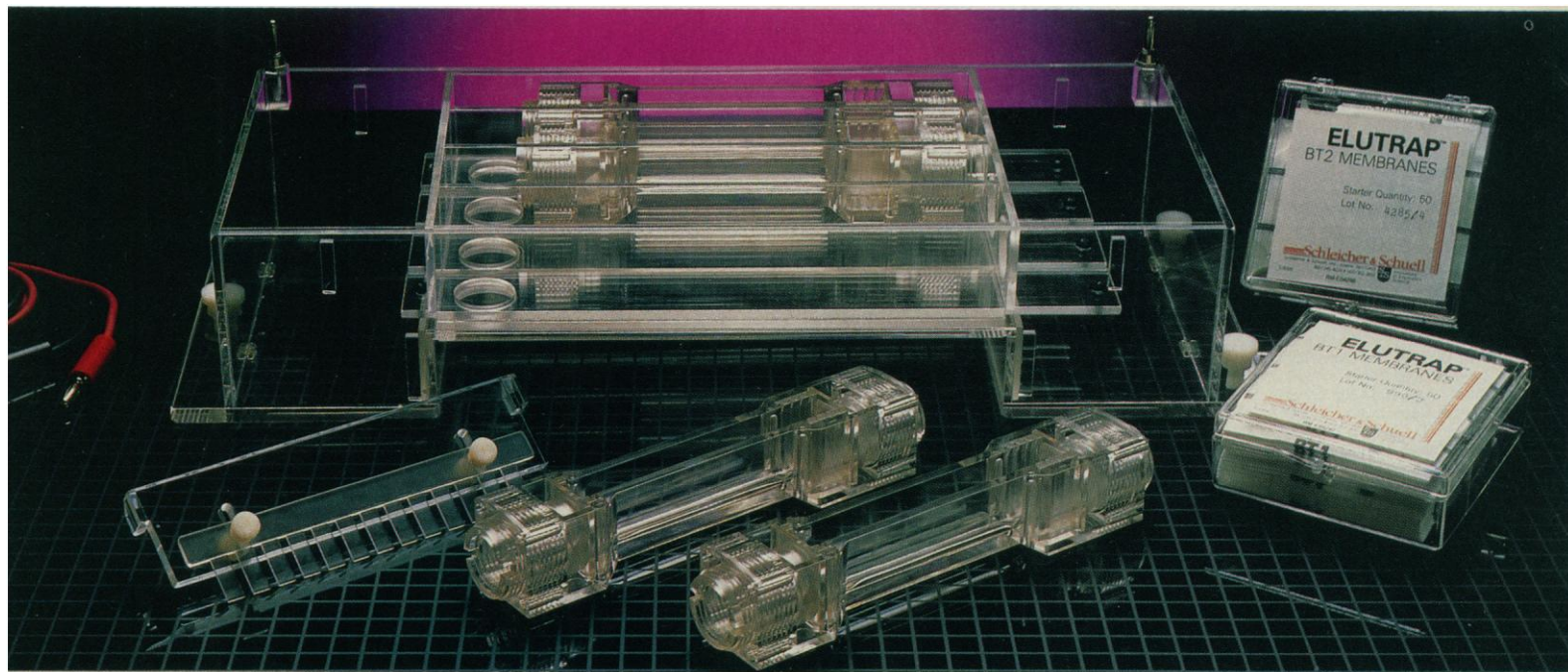
The legal difficulties outlined by Dickens clearly show that an internally consistent plan has yet to be achieved in any country. Some Iron Curtain countries make it a crime for an infected individual to have intercourse without informing the partner. Other societies are reluctant to put any limits on groups which they feel are already suffering opprobrium for unconventional behavior.

An impressive feature of this collection of articles is how much one compartmentalized subject requires information from another. Thus, the promise of an educational campaign is shown to be inevitably intertwined with the scientific and legal aspects of the disease. The legal aspects are certainly intertwined with the expense of treating the disease and the political clout of the parties affected. Ethical solutions appropriate for one group may be totally inappropriate for another. The staggering expense of AIDS is sure to conflict with monetary demands for other social programs.

In a recent issue of *Science* (22 January, p. 375) the history of the syphilis epidemic was recounted. Many decisions made then, no doubt expedient at the time, do not appear justified today. Decisions today have to be made on the shifting sand of public emotion, if not hysteria, and changing scientific facts. Perhaps the question, "How will we look to future generations?" may be the best test for evaluating our current attitudes and decisions.

—DANIEL E. KOSHLAND, JR.

Use another purification system and you may never fully recover.



ANNOUNCING THE ELUTRAP® SYSTEM FOR THE ISOLATION AND PURIFICATION OF NUCLEIC ACIDS AND PROTEINS.

When you're purifying a precious sample, the closer you get to 100% sample recovery the better.

That's why we developed the Elutrap System for rapid elution, concentration and isolation of nucleic acids and proteins.

It's the most efficient electroseparation system available. With the highest recovery rate of any method.

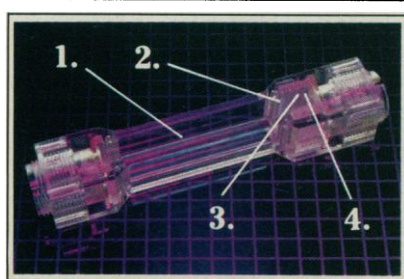
How high?

Using the Elutrap device you can achieve greater than 95% recovery in a few hours. Run it over night, and yields approach total recovery.

Results like this are possible because of proprietary S&S membranes used in the Elutrap device.

The BT2 membrane acts as a "trap"

prefilter while the BT1 exclusion membrane retains the sample molecule. It's that simple.



HOW IT WORKS.

1. Simply place gels or solutions in the sample chamber. Apply current to the system.
2. Charged fragments migrate directly through the BT2 membrane toward the opposite pole.
3. "Trap" volume can be adjusted to as low as 200 μ l by moving the BT2 membrane.
4. The proprietary BT1 membrane prevents the sample from passing. Once elution is complete, the sample is easily retrieved from the trap area using a standard pipet.

20 TO 30% MORE EFFICIENT.

The secret behind our 20 to 30% increase in efficiency over other systems is a specially designed electrophoresis chamber and tray insert.

The chamber is designed to regulate the flow of current only through the channel containing the Elutrap device. Empty channels are closed, so current is maximized.

The results — peak efficiency whether you are running one, two, three or four Elutrap devices simultaneously.

TALK TO US.

Get the complete story on the Elutrap System. Call an S&S sales representative and ask about a 30-day trial offer.

We'll send our new full color brochure which answers any questions you may have about the Elutrap System.

Do it today. And you'll be well on your way to a full recovery.

Schleicher & Schuell

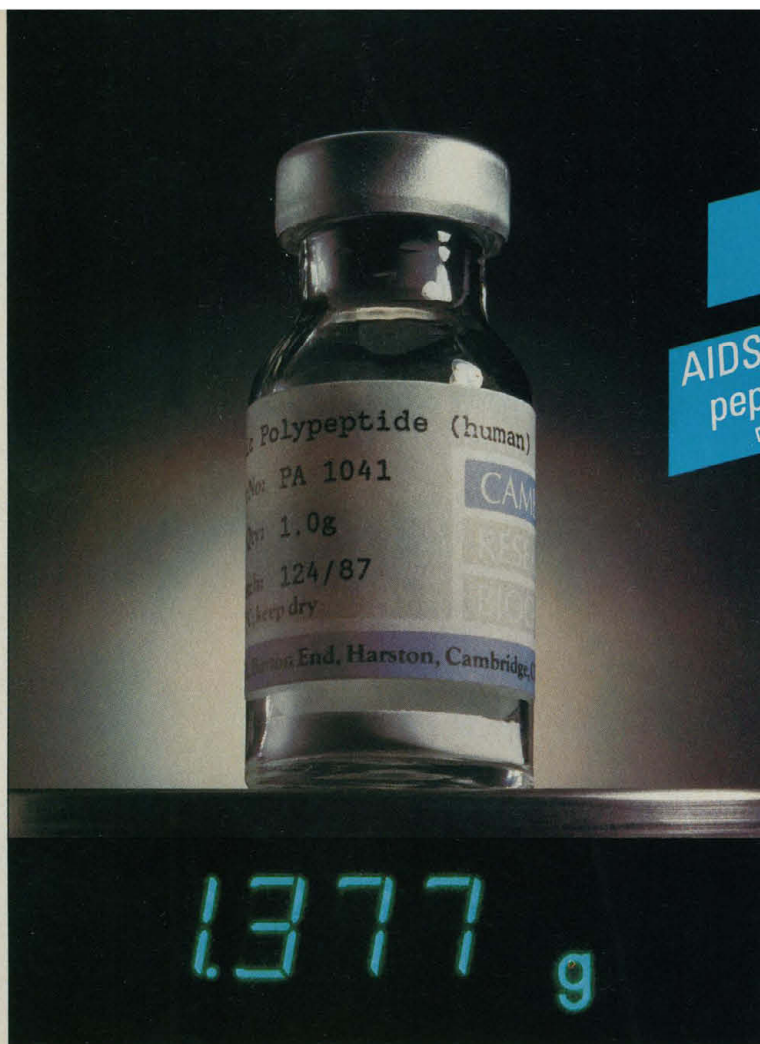
Keene, NH 03431 • 800-245-4024 • 603-352-3810

Circle No. 161 on Readers' Service Card

SEE US AT THE MIAMI WINTER SYMPOSIA — BOOTH #38

NEW!

**AIDS (HIV) gp 41-derived
peptides now available**
[Gnann et al., Science 237, 1346 (1987)]



To you it's precisely 1 gram of peptide

Forget what the balance says. Rely on what we say. Whether it's a gram or a milligram, the amount of peptide in the vial is *precisely* the amount we quote on the accompanying data sheet.

There's no big secret. We simply supply our peptides by Net Peptide Weight, taking into account the inevitable counter-ion and water content of a preparation.

We offer a lot more you can rely on including a choice from hundreds of off-the-shelf bR grade peptides for neuroscience; oncoprotein derived products for developmental and cancer biology; special products and services for molecular biology and a confidential custom synthesis service in bulk quantities if required.

And all our peptides are guaranteed in excess of 95% purity.

As you can see we don't take peptides lightly.

Contact us now for full details.

Circle No. 160 on Readers' Service Card

**CAMBRIDGE
RESEARCH
BIOCHEMICALS**

Cambridge Research
Biochemicals Inc.,
Suite 202,
10 East Merrick Road,
Valley Stream,
New York 11580 USA.
Tel: (516) 825-1322
Toll Free Tel: (800) 327-0125
Fax: (516) 825-1519

Cambridge Research
Biochemicals Ltd.,
Button End, Harston,
Cambridge,
England CB2 5NX.
Tel: (0223) 871674
Toll Free Tel: (0800) 585396
Telex: 817694 CRBLTD G
Fax: (0223) 872381

CR11

Whatever your application, a Finnnp



Finnnpipettes from  Labsystems.

Labsystems Oy, P.O.Box 8, 00881 Helsinki, Finland, tel. int'l. + 358-0-75821, telex 1002048 labso sf. Austria: Vienna, tel. 1-435901-0, Belgium: Antwerp, tel. 03-2312725. France: Paris, tel. 1-69079750. West Germany: Munich, tel. 089/502 6027-9. Italy: Milan, tel. 2-2827541, Japan: Tokyo, tel. 03-355-5630. The Netherlands: Waddinxveen, tel. 01878-10233. Spain: Barcelona, tel. 3-2106461. Sweden: Stockholm, tel. 08-931370. UK: London, tel. 0895-38421. USA: Chicago, tel. (Toll Free) 800-572-8270.

ipette's the answer.

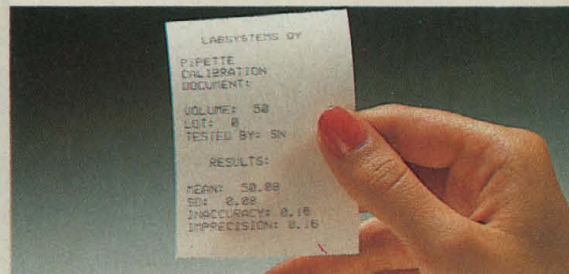
From single-channel and multichannel pipettes through to the unique Diluter, LabSystems' Finnpipette range of liquid handling equipment offers you the widest choice on the market. The Digitals shown here for example go right down to 0.5 μ l. All with fully validated accuracy and precision. And because we understand the nature of your work, easy and above all comfortable to use. To ensure best results we also supply a full range of quality disposables and accessories. So whatever field you're working in – clinical chemistry, microbiology, genetechonology – take a tip and start using Finnpipettes.



Ease of use and comfort – Simply turn the thumb button. It clicks to the desired volume. No scales to align. Instead check the clear, easy-to-read digital display and start pipetting. Without straining your hand... even after hours of use – thanks to the lightness and comfort common to all Finnpipettes.

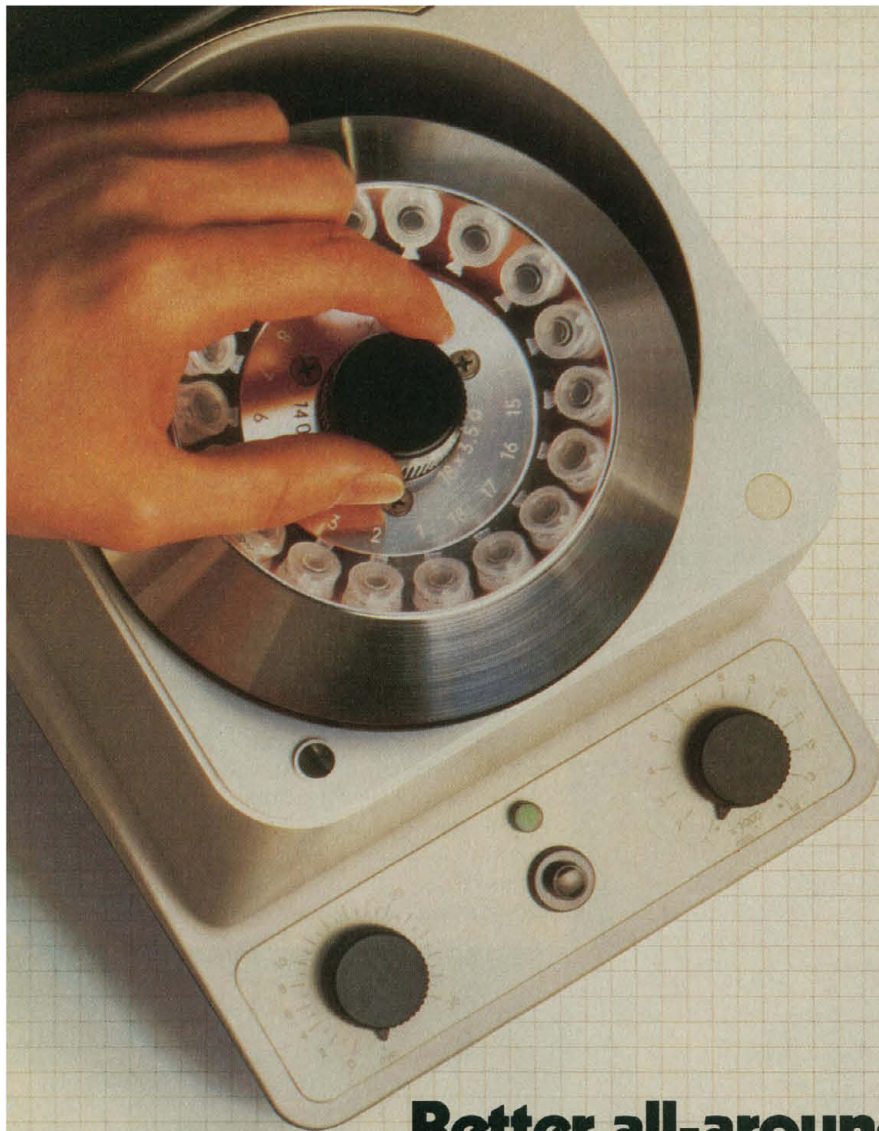


Safety and durability – The streamlined unobtrusive tip ejector ensures safety even with biohazardous materials. And also prevents accidental detipping. Durable construction and space-age plastics mean longer bench life.



Accuracy and precision – Each Finnpipette arrives ready for use with its own accuracy validation certificate. What's more, recalibration can be carried out in your laboratory, quickly and easily.

Full range of quality disposables – for best results we recommend using Finntips. Made from clear contamination-free plastic, they are available vertically packed for added convenience in boxes, or bulk-packed in economically-sized bags and trays.



The Eppendorf Micro Centrifuge.

With 18-tube capacity, variable speed, quiet operation, and quick-release rotor.

Better all-around performance.

Higher capacity...plus.

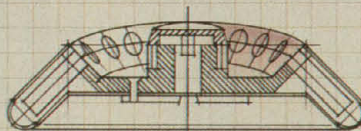
The 18-tube Model 5415 Micro Centrifuge gives you important operating advantages—with unique Eppendorf quality.

Versatile in use.

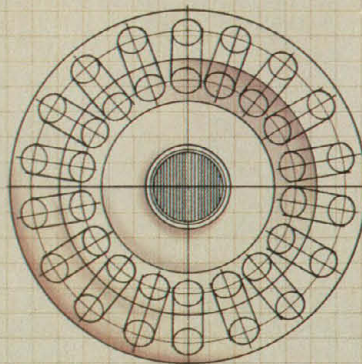
Model 5415 has a variable-speed motor that reaches a maximum of 14,000 rpm with an RCF of 16,000 x g; a 30-minute timer; and a momentary button for short spins. It accepts 1.5 mL, 500 μ L, 400 μ L, and 250 μ L Eppendorf microcentrifuge tubes and blood collection microtubes, such as B-D Microtainer® Tubes.*

Superior rotor design.

The enclosed rotor design reduces air turbulence for quiet operation. And the unique quick-release feature lets you transport the rotor *with* tubes—especially convenient when the centrifuge is run in a cold room.



Enclosed rotor design reduces air turbulence and noise. Tubes are angled precisely at 45° to maximize pellet formation.



Quick-release feature allows the 18-position rotor to be easily transported even when loaded.

*Microtainer® Tubes is a registered trademark of Becton Dickinson and Company.

Safe and rugged.

The Eppendorf 5415 Micro Centrifuge is UL listed for safety. It's so rugged that an accidentally unbalanced load won't cause excessive vibration or motor damage.

Call 800-645-3050; in New York, 516-334-7500, for more information. Or write Brinkmann Instruments, Inc., Cantiague Road, Westbury, NY 11590. (In Canada: 416-675-7911; 50 Galaxy Blvd., Rexdale, Ont. M9W 4Y5)

Specifications

Maximum speed	14,000 rpm
Maximum RCF	16,000 x g
Test-tube capacity	18
Time required for maximum speed	10 sec
Time required to stop	12 sec
Dimensions (L x W x H)	28 x 21 x 28.5 cm

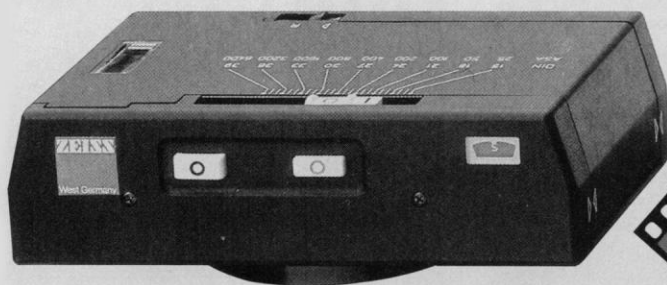
For information circle reader service number 114
For a demonstration circle reader service number 115
See us at Pittsburgh Conference — Aisle 1300

BRK-5526

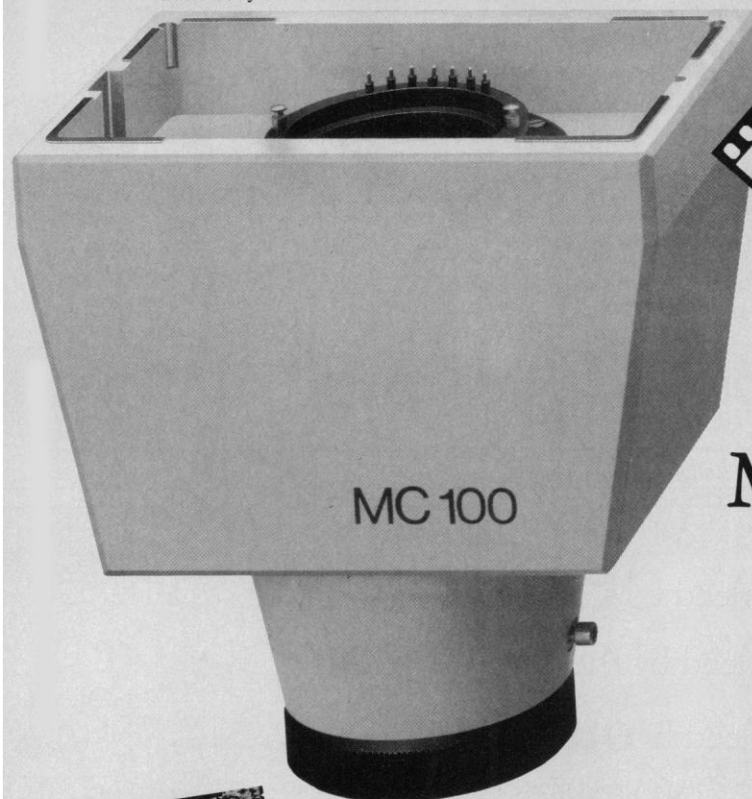
eppendorf

Shaping the future. **Brinkmann**
INSTRUMENTS, INC.

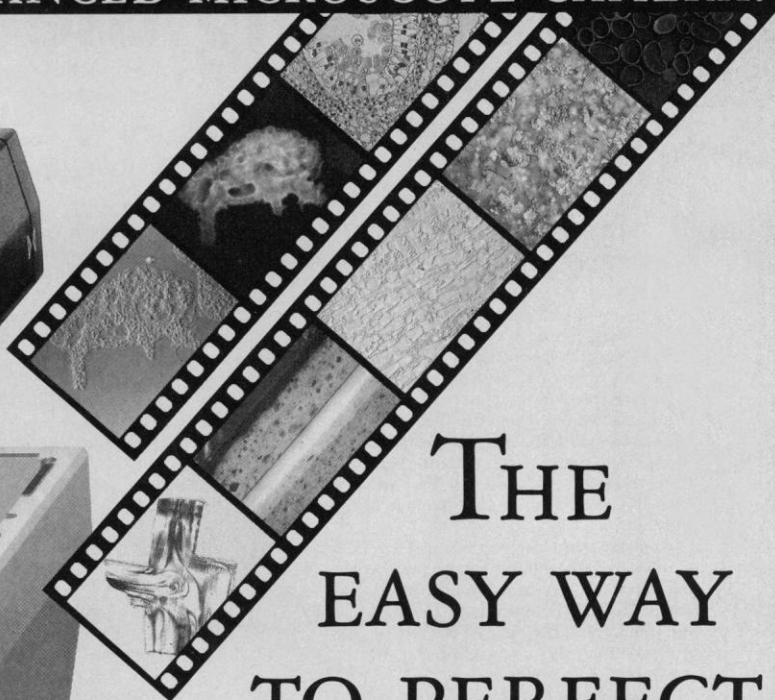
MC 100: THE NEW, ADVANCED MICROSCOPE CAMERA.



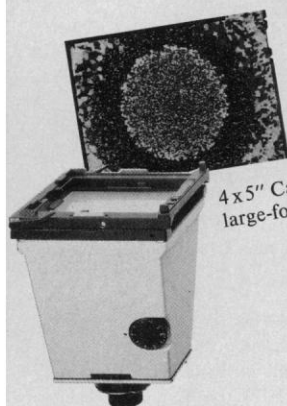
Basic body MC100 with film cassette 35 mm Mot



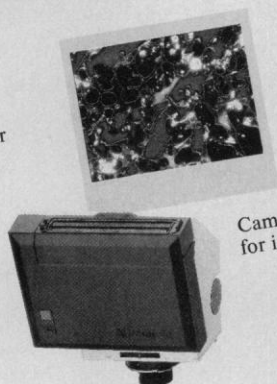
MC 100



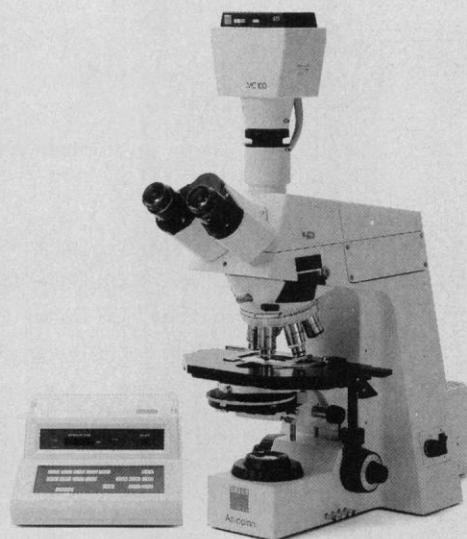
THE
EASY WAY
TO PERFECT
PHOTO-
MICROGRAPHY.



4x5" Camera attachment for large-format photography



Camera attachment CB 33 for instant photography



Perfect photomicrography can no longer be considered a tedious task. The new MC100 Microscope Camera from Carl Zeiss proves why.

The fully-corrected camera lens assures pictures of outstanding brilliance and striking color fidelity. Every detail of the superior microscope image generated by the unique new Zeiss

ICS optics reaches the film.

Microscopists who spend hours preparing specimens and searching for important results to be documented will appreciate the exceptional ease of operation and reliability of the MC100 system. Switching between 35 mm, **large-format** and **instant photography** is fast and convenient.

The new Zeiss microscope camera is also the best choice for those less experienced in photomicrography. At the touch of a button, the brilliant images exactly as seen in the microscope are recorded on the film - exposure after exposure, with absolute reliability.

For complete details on the new, exciting MC100 Microscope Camera, contact your Zeiss dealer.

For the dealer nearest you, call (800) 233-2343. In New York State (914) 681-7755.

Carl Zeiss, Inc.

One Zeiss Drive
Thornwood, NY 10594
914-747-1800



For literature circle reader service number 88
For literature & demonstration circle reader service number 89

Introducing the new Sci Can T-Cell Recovery Column

Replaces Nylon Wool Columns and T-Cell Rosettes

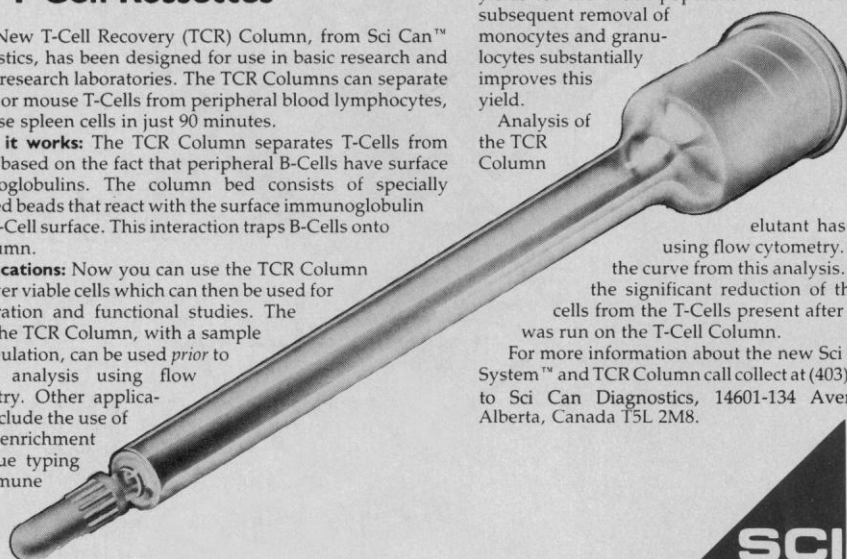
The New T-Cell Recovery (TCR) Column, from Sci Can™ Diagnostics, has been designed for use in basic research and clinical research laboratories. The TCR Columns can separate human or mouse T-Cells from peripheral blood lymphocytes, or mouse spleen cells in just 90 minutes.

How it works: The TCR Column separates T-Cells from B-Cells based on the fact that peripheral B-Cells have surface immunoglobulins. The column bed consists of specially prepared beads that react with the surface immunoglobulin of the B-Cell surface. This interaction traps B-Cells onto the column.

Applications: Now you can use the TCR Column to recover viable cells which can then be used for enumeration and functional studies. The use of the TCR Column, with a sample cell population, can be used *prior* to further analysis using flow cytometry. Other applications include the use of T-Cell enrichment for tissue typing and immune status monitoring.

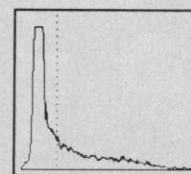
Proven Performance: Based on analysis, over 95% of the B-Cells are retained by the Sci Can TCR Column, with typical yields for the T-Cell population of 70% or greater. Prior or subsequent removal of monocytes and granulocytes substantially improves this yield.

Analysis of the TCR Column

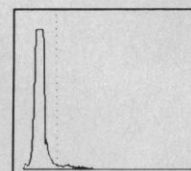


elutant has been performed using flow cytometry. Graph #1 shows the curve from this analysis. Graph #2 shows the significant reduction of the contaminating cells from the T-Cells present after the same sample was run on the T-Cell Column.

For more information about the new Sci Can Cell Passage System™ and TCR Column call collect at (403) 455-6079 or write to Sci Can Diagnostics, 14601-134 Avenue, Edmonton, Alberta, Canada T5L 2M8.



PBL's prior to separation. Treated with CD4 & CD8 monoclonal antibodies. Goat anti-mouse IgG and IgM FITC used to identify T-Cells.



Showing reduction of B-Cells from previous analysis. PBL's after separation. Elutant treated with FITC labelled goat anti-human IgG and IgM to identify B-Cells.

Circle No. 21 on Readers' Service Card

Prize competition

announced by the

Anna Monika Foundation

for the investigation of the physical substrate and functional disturbances of depressions by approval of the Minister of the Interior of Nordrhein-Westfalen, Düsseldorf, 9th of June, 1965.

The Foundation announces the following prizes:

First Prize US-Dollar 15.000,—

Second Prize US-Dollar 10.000,—

Third Prize US-Dollar 5.000,—

preferably for studies of biochemical, histological, neurophysiological, neuropathological, psychopharmacological, psychiatric or psychosomatic nature. The studies should be carried out in close cooperation with a psychiatric clinic, an university or an equivalent scientific institution. As far as possible, the papers should give information about recent advances in knowledge that should be helpful in promoting treatment and would open up new paths of progress. The papers may be written in German, French or English and should be submitted to the Chairman of the Committee, Prof. Dr. P. Kielholz, Basel/Switzerland. Besides hitherto unpublished studies, papers published in the past two years in an international professional journal may also be submitted. Deadline for submission to the Committee is 30th of September, 1989. To help the Committee to come to a speedy decision it is requested that a maximum of three publications in four copies as well as a summarizing report (approx. 600 words) of the studies submitted for the competition should be included. Prizes will be awarded on 30th of June, 1989. If, in the opinion of the Committee, no papers of sufficient merit are submitted, it reserves the right to present no award. Prizes and their amounts will be awarded according to the merits of the study in question. Subject to the Committee's decision, each prize can be divided between two papers.

The Committee of Judges:

Chairman: Prof. Dr. med. P. Kielholz, Psychiatrische Universitätsklinik, Basel; Wilhelm-Klein-Strasse 27, CH-4056 Basel.

Members:

Prof. Dr. J. Angst, Psychiatrische Universitätsklinik, Zürich/Schweiz

Prof. Dr. G. Baumgartner, Neurologische Universitäts- und Poliklinik, Zürich/Schweiz

Prof. M. Burger, Biozentrum, Basel/Schweiz

Prof. Dr. Otto Creutzfeldt, Max-Planck-Institut für Biophysikalische Chemie, Göttingen, FRG

Prof. Dr. H. J. Dengler, Medizinische Universitätsklinik, Bonn-Venusberg

Prof. Dr. Alfred M. Freedman, Department of Psychiatry, New York Medical College, Valhalla, New York/USA

Prof. Dr. K. Heinrich, Psychiatrische Universitätsklinik, Düsseldorf, FRG

Prof. Dr. H. Helmchen, Psychiatrische Universitäts- und Poliklinik, Berlin

Prof. Dr. Albert Herz, Max-Planck-Institut für Psychiatrie, Martinsried, FRG

Prof. Dr. H. Hippus, Psychiatrische Klinik und Poliklinik der Universität München

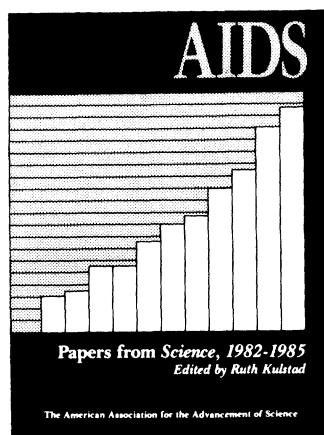
Prof. Dr. D. Palm, Zentrum für Pharmakologie der Johann-Wolfgang-von-Goethe-Universität, Frankfurt/Main

Prof. Pierre Pichot, Paris/Frankreich

Prof. Dr. K. Sandhoff, Institut für Organische Chemie und Biochemie der Universität, Bonn

Prof. Dr. Wilhelm Stoffel, Institut für Physiologische Chemie der Universität Köln

Managing Director: Prof. Dr. Benno Hess, Am Kaiserhain 19, D-4600 Dortmund 1



A One-Volume Library of Essential AIDS Research

AIDS: Papers from Science, 1982-1985

Edited by Ruth Kulstad

Some of the most frequently cited papers on acquired immune deficiency syndrome (AIDS) that appeared in *Science* between August 1982 and September 1985 are included in this volume. Arranged chronologically, these 108 research papers and *Science* news reports show how far AIDS research has come and provide an indication of the directions in which it might go. This fully indexed collection is useful not only for the experimental data and conclusions, but also as an excellent source of references to AIDS work in other major journals worldwide.

An overview of research in AIDS to date is provided in the introduction by Dr. Myron Essex, chairman of the Department of Cancer Biology, Harvard University School of Public Health.

654 pp.; fully indexed and illustrated

Hardcover \$32.95 (AAAS member price \$26.35)

Softcover \$19.95 (AAAS member price \$15.95)

Order from: AAAS Marketing, Dept. A, 1333 H St., NW, Washington, DC 20005. Add \$1.50 postage and handling per order. Allow 4-6 weeks for delivery.

American Association for the Advancement of Science

Yes! Please send me the following copies of *AIDS: Papers from Science, 1982-1985*:

____ hardcover \$32.95 (AAAS member price \$26.35) \$ ____

____ softcover \$19.95 (AAAS member price \$15.95) \$ ____

Postage and handling \$ 1.50

TOTAL \$ ____

☐ Check ☐ VISA ☐ MasterCard

credit card number

expiration date

signature

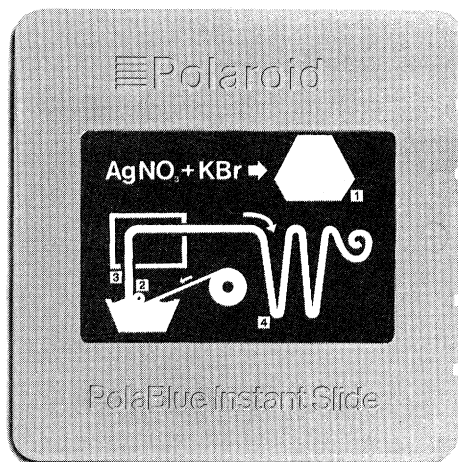
Name _____

Street Address _____

City _____ State _____ Zip _____

AAAS member number (from *Science* mailing label) _____

Thank you for your order. Please send it to: AAAS Marketing, Dept. A, 1333 H Street, NW
Washington, DC 20005. Please allow 4-6 weeks for delivery.



NEW PolaBlue



**NEW High-Contrast
PolaChrome**

More ways to show what's

Now you've got five ways to make great presentations. In house. In minutes.

With Polaroid's complete line of 35mm instant slide films, you can document or present all kinds of scientific information quickly, easily and cost effectively.

There are five films to choose from including our two newest. PolaBlue—for brilliant, professional-quality white-on-blue slides of

words, charts and technical diagrams. And High Contrast PolaChrome—for color enhanced reproduction of photomicrography, computer graphics, drawings, and other scientific data.

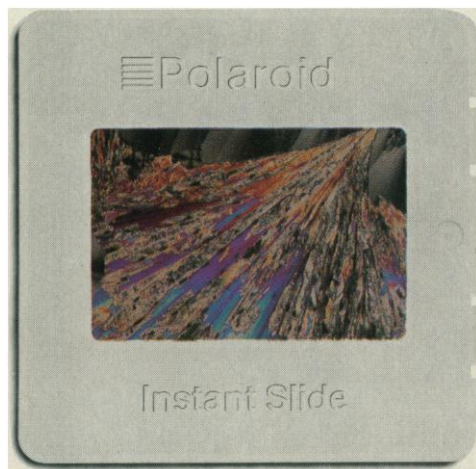
The other three films are: PolaPan, a general purpose, continuous tone black

and white slide film offering a wide range of gray tones; PolaGraph, a brilliant, high contrast black and white slide film

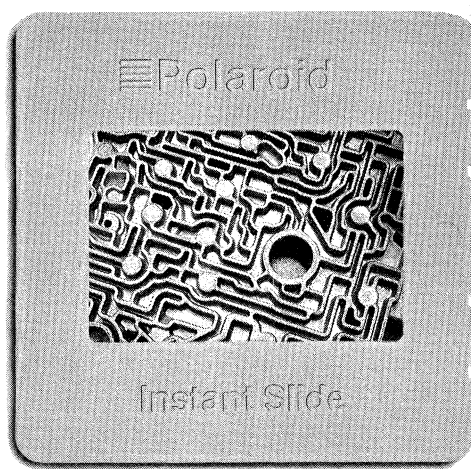
ideal for copying text or equations; and PolaChrome, a general purpose color film for any type of scientific recording.

All five films can be used

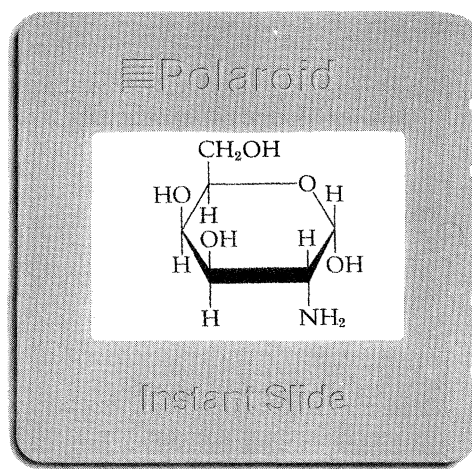




PolaChrome



PolaPan



PolaGraph

on your mind. Instantly.

with any 35mm SLR camera. Plus you can easily prepare the slides yourself in minutes with the motorized PowerProcessor or the manual AutoProcessor and the Illuminated Slide Mounter.

The advantages are clear. There's no waiting for outside lab processing. You never have to pay a premium for rush services. You get immediate results. And you can make last minute corrections. Plus you have the security of knowing

that all your proprietary information is kept in house.

So next time you need to show what's on your mind, remember the instant solution—Polaroid.

For more information or the name of the dealer nearest you, call toll-free 800-343-5000, 8 a.m. to 8 p.m. Eastern Time.

 **Polaroid**

Circle No. 137 on Readers' Service Card

For more information about Polaroid 35mm Instant Slide Films and Processors mail this coupon to Polaroid Corporation, Dept. 685, P.O. Box 5011, Clifton, NJ 07015.

Name _____ SC 2/5

Company _____

Address _____

City _____

State _____ ZIP _____

Telephone _____

"Polaroid," "PolaChrome," "PolaPan," and "PolaGraph"®
"PolaBlue"™ © 1987 Polaroid Corporation

New from Cambridge

Selected as one of the "Best Sci-Tech Books of 1987"

— *Library Journal*

Microcosmos

Jeremy Burgess, Michael Marten and Rosemary Taylor

"...a weirdly beautiful book of microscopic photographs..."

— *Newsweek*

Microcosmos brings together some of the most spectacular imagery ever produced by the microscope. It contains over 300 stunning color and black-and-white photographs that explore the human body, animals, plants, the cell, the inorganic world, the industrial world, and the everyday world.

1987 / 30433-4 / 208 pp. / Cloth \$29.95 / £15.00

Winner of the 1987 Phi Beta Kappa Award

Chemicals and Society

A Guide to the New Chemical Age

Hugh Crone

Provides a sound scientific understanding of the facts and issues behind the growing use and misuse of chemicals in our society.

1987 / 256 pp. / 30869-0 / Cloth \$39.50 / £27.50

31359-7 / Paper \$14.95 / £9.50

The Correspondence of Charles Darwin

Volume 3 1843-1846

Edited by Frederick Burkhardt and Sydney Smith

"...The editors...have provided admirably self-contained volumes, which one need not be a Darwin scholar to read with profit..."

— *The New Yorker*

This is the third volume of the complete edition of *The Correspondence of Charles Darwin*, making available for the first time the full authoritative texts of Darwin's letters. Included is his correspondence with Joseph Dalton Hooker.

1988 / 560 pp. / 25589-9 / Cloth \$37.50 / £30.00

Three Hundred Years of Gravitation

Edited by S.W. Hawking and W. Israel

To commemorate the 300th anniversary of the publication of Isaac Newton's *Philosophiæ Naturalis Principia Mathematica*, the editors have assembled a series of unique review papers by many of the world's foremost researchers in cosmology, relativity, and particle physics.

1987 / 704 pp. / 34312-7 / Cloth \$69.50 / £45.00

Nearby Galaxies Catalog

R. Brent Tully

Designed as a companion to the *Nearby Galaxies Atlas*, this catalog consists of three tables that provide information on the 2,367 galaxies that are mapped in the atlas.

1988 / 250 pp. / 35299-1 / Cloth about \$49.50 / About £30.00

Also available...

Nearby Galaxies Atlas

R. Brent Tully and J. Richard Fisher

1987 / 60 pp. / 24 color maps / 30136-X / Cloth \$59.50 / £35.00

Dynamics of Proteins and Nucleic Acids

J.A. McCammon and S.C. Harvey

This book describes in detail the major theoretical methods that are likely to be useful in the computer-aided design of drugs, enzymes, and other molecules.

1987 / 220 pp. / 30750-3 / Cloth \$39.50 / £27.50

At bookstores or order from

Cambridge University Press

32 East 57th Street, NY, NY 10022.

Cambridge toll-free numbers for orders only:

800-872-7423, outside NY State, 800-927-0247, NY State only.

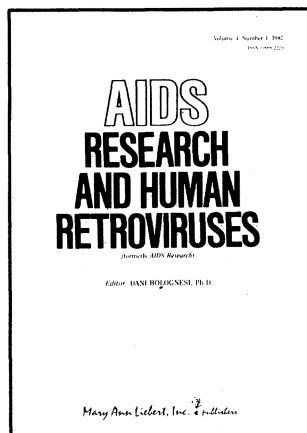
MasterCard and Visa accepted.

LET LIFE FOOL YOU ONCE AND YOU COULD BE FOOLED FOR LIFE

There was a time when you could buy life insurance and know exactly what your benefits would be down the line. It's not so easy anymore. Today, insurance plans feature complicated investment devices tied to fluctuating interest rates. And while the minimum and maximum amounts payable are fixed, your beneficiary might get less than you planned for. Simple isn't always better, but many insurance experts recommend you look at Term Life Insurance. It pays what it promises...no fancy investment footwork...right up to the termination age.

Which is why the AAAS endorses its own Term Life Insurance Plan—it's the purest and most inexpensive kind of life insurance. Each AAAS member can apply for up to \$240,000 of coverage with generous protection for the family, too.

Interested? Simply contact the Administrator, AAAS Group Insurance Program, 1255 23rd Street, N.W., Suite 300, Washington, D.C. 20037, or call Toll-Free 800/424-9883 (in Washington, D.C. call 202/296-8030). They will be pleased to answer any questions you may have about this valuable member benefit.



Now bimonthly in 1988...

AIDS RESEARCH AND HUMAN RETROVIRUSES

Editor: Dani Bolognesi, Ph.D.

Editorial Board

Section Editors

Cell Biology
Luc Montagnier

Molecular Biology
Flossie Wong-Staal

Clinical Investigations
Jerome E. Groopman

Epidemiology
James Curran

Vaccine R&D
Laurence A. Lasky

David W. Barry
William A. Blattner
Samuel Broder
Donald S. Burke
Ansène Burny
Luigi Chieco-Bianchi
Che-Yen Chuang
A. Gus Dalglish
Guy De Thé
Myron E. Essex
Anthony S. Fauci
Peter J. Fischinger
Margaret A. Fischl
Patricia Fultz

Robert C. Gallo
James J. Goedert
Michael S. Gottlieb
William A. Haseltine
Barton F. Haynes
Martin S. Hirsch
James A. Hoxie
Kun-Yen Huang
Gerhard Hunsmann
Mark Kaplan
Ronald Kennedy
David Klatzmann
Hilary Koprowski
H. Clifford Lane

Jeffrey Laurence
Jacques Leibowitch
Paul A. Luciw
Jonathan Mann
Thomas J. Matthews
J. Steven McDougal
Michael S. McGrath
Thomas C. Merigan
Andre Nahmias
Takis S. Papas
Stephen R. Petteway, Jr.
Frank Polk
Mikulas Popovic
Thomas C. Quinn

Robert R. Redfield
Lee Ratner
Bijan Safai
George M. Shaw
Takashi Sugimura
Paul Volberding
Simon Wain-Hobson
Robin A. Weiss
Hans Wigzell
Robert Yarchoan
Mitsuaki Yoshida
Daniel Zagury

AIDS RESEARCH AND HUMAN RETROVIRUSES provides a central forum for studies of new viruses pertaining to cancer, degenerative diseases, and the immune system.

From Recent Issues

A New Human Retrovirus Isolate of West African Origin (SBL-6669) and Its Relationship to HTLV-IV, LAV-II, and HTLV-III_B, *J. Albert, U. Bredberg, F. Chiodi, B. Böttiger, E. M. Fenyö, E. Norrby, and G. Biberfeld*

Genetic Analysis of a New Subgroup of Human and Simian T-Lymphotropic Retroviruses: HTLV-IV, LAV-2, SBL-6669, and STLV-III_{AGM}, *G. Franchini, E. Collalti, S. K. Arya, E. M. Fenyö, G. Biberfeld, J. F. Zagury, P. J. Kanki, F. Wong-Staal, and R. C. Gallo*

HTLV-I Infection of Cerebrospinal Fluid T Cells from Patients with Chronic Neurologic Disease, *E. DeFreitas, Z. Wroblewska, G. Maul, W. Sheremata, P. Ferrante, E. Lavi, M. Harper, F. Di Marzo-Veronese, and H. Koprowski*

Human Immunodeficiency Virus: The Eighth Gene, *F. Wong-Staal, P. K. Chanda, and J. Gharyeb*

Transcription Directed by the HIV Long Terminal Repeat In Vitro, *R. Patarca, C. Heath, G. J. Goldenberg, C. A. Rosen, J. G. Sodroski, W. A. Haseltine, and U. M. Hansen*

Complete Nucleotide Sequences of Functional Clones of the AIDS Virus, *L. Ratner, A. Fisher, L. L. Jagodzinski, H. Mitsuya, R.—S. Liou, R. C. Gallo, and F. Wong-Staal*
Characterization of Serum Neutralization Response to the Human Immunodeficiency Virus (HIV), *J. E. Groopman, P. M. Benz, R. Ferriani, K. Mayer, J. D. Allan, and L. A. Weymouth*

Transmission of HIV by Antigen Presenting Cells During T-Cell Activation: Prevention by 3'-Azido-3'-Deoxythymidine, *H. K. Lyerly, O. J. Cohen, and K. J. Weinhold*

Analysis of Human Serum Antibodies to Human Immunodeficiency Virus (HIV) Using Recombinant ENV and GAG Antigens, *W. Kenealy, D. Reed, R. Cybulski, D. Tribe, P. Taylor, C. Stevens, T. Matthews, and S. Petteway*


Lack of Endemic HIV Infection in Venezuela, *J. Azocar, C. Martinez, M. F. McLane, J. Allan, and M. Essex*

Case Report: Response of AIDS-Related Thrombocytopenia to Intravenous and Oral Azidothymidine (3'-Azido-3'-Deoxythymidine), *M. S. Gottlieb, P. R. Wolfe, and S. Chafey*

Vol. 4, 1988 6 Issues \$125 USA \$158 Overseas/Air

ISSN: 0889-2229

To subscribe, send a check or money order made out to
Mary Ann Liebert, Inc. together with your name and mailing address to: Box ARV

Mary Ann Liebert, Inc.  publishers

1651 THIRD AVENUE, NEW YORK, NY 10128 • (212) 289-2300

Circle No. 135 on Readers' Service Card



**PUT YOURSELF INTO
High-Performance Image Analysis**

With **MICROCOMP®** you get Flexible configuration • Ease of use
• Modular programs • Image-capture board • Impressive list of options.

Applications include *Interactive Planar Morphometry • Autoradiography Grain Counting • Microdensitometry • Particle Sizing • Time-Lapse Studies.*

You deserve a demonstration.

SMI SOUTHERN MICRO INSTRUMENTS, INC.
120 Interstate North Parkway East Suite 308
Atlanta, Georgia 30339
404-956-0343 □ 800-241-3312 □ Telex 887985

Circle No. 55 on Readers' Service Card

SOFTWARE

TADPOLE III

Major update of the popular numeric database/analysis package for IBM PC

NEW! Graphics including histograms, line graphs, scatter plots, pie-charts.

NEW! Extra statistics including 3-way ANOVA and Multiple Regression with up to nine variables.

NEW! Enhanced data input and editing.

NEW! Help information available on screen at any time.

NEW! Manual totally re-written with the new user in mind. Comprehensive examples given.

TADPOLE III is a database: Each TADPOLE database can have up to 9999 records with 60 fields per record. Each field has a descriptive name and can store a real number (decimals and negatives included). Exclusive, inclusive and relationship sorting of records can be performed for printing or statistical analysis. TADPOLE can also handle missing data, verify records, restructure or merge databases, transfer data to mainframes and capture data from ASCII files including LOTUS 1-2-3 PRN. TADPOLE provides maximum possible security for your data.

TADPOLE III is a statistics package: Data can be downloaded from the database or keyed directly into the statistics module (and stored if need be). Arithmetic

transformation can be done (logs, roots, powers, reciprocals, multiply by factor). Statistics include:

Descriptive: Mean, standard deviation, standard error, skewness, kurtosis, minimum/maximum plus range, median, frequency analysis.

Parametric: Student t test for paired and unpaired data, linear regression, correlation, ANOVA (1, 2 or 3-way).

Non-parametric: Contingency tables (chi-squared 2x2 or N x K, Fisher exact test, McNemar test for the significance of change), one-sample chi-squared, Mann-Whitney U test, Wilcoxon signed-ranks matched-pairs test, Spearman rank correlation coefficient, Kendall rank correlation coefficient, Kendall coefficient of concordance, Kruskal-Wallis one-way analysis of variance, Friedman two-way analysis of variance, Mantel-Haenszel survivorship (Logrank) test.

For comprehensive non-linear curve-fitting, TADPOLE III files can be transferred to ENZFITTER, which is also available from BIOSOFT.

Manual plus two 5.25" floppy disks for IBM PC series (256K RAM minimum, DOS 2.0 or later). Adapter required for graphics (CGA, EGA or Hercules GA).

Price \$249

BIOSOFT

P.O. Box 580, Milltown, New Jersey 08850. Telephone (201) 613 9013.

Circle No. 19 on Readers' Service Card

A MUST for your science collection

Books from Science

AIDS; *R. Kulstad, ed.* Research papers and reports on acquired immune deficiency syndrome (AIDS) published between August 1982 and September 1985 show how far AIDS research has come and provide an indication of the directions in which it might go.

1986; case \$32.95; paper \$19.95; 653pp

Astronomy & Astrophysics; *M.S. Roberts, ed.* From the solar system to the pulsars at the very edge of the observable universe, this volume reveals a broad, coherent, and contemporary picture of our astronomical universe.

1985; case \$29.95; paper \$17.95; 383pp

Neuroscience; *P.H. Abelson, E. Butz, S.H. Snyder, eds.* Neuroscience research ranging from genetic engineering to clinical therapy is presented. Provides an integrative treatment of brain anatomy, physiology, and chemistry and addresses fundamental questions concerning nervous system functioning.

1985; case \$29.95; paper \$14.95; 453 pp

Biotechnology & Biological Frontiers; *P.H. Abelson, ed.* Covers the most important topics at the forefront of biological R&D and deals with both fundamental research techniques and practical applications. For researchers and students in all fields of biology, agriculture, and the health sciences.

1984; case \$29.95; paper \$14.95; 550pp

Biotechnology: The Renewable Frontier *D.E. Koshland, Jr., ed.* Like its predecessor, this new volume covers the latest and most important topics in biological R&D.

1986; case \$29.95; paper \$17.95; 384 pp

Frontiers in the Chemical Sciences; *W. Spindel, R.M. Simon, eds.* Details progress in all areas of chemistry, including new work in ultrafast reactions, catalysis, conduction organics, enzyme mechanisms, and materials and analysis.

1986; case \$29.95; paper \$17.95; 624pp

Order from AAAS Sales Dept C, 1333 H St. NW, Washington, DC 20005. Add \$1.50 postage & handling per order; allow 4-6 weeks for delivery.

**American Association for
the Advancement of Science**

Get the weekly report on AIDS research

Acquired Immune Deficiency Syndrome is one of the most important scientific research topics today. Each week, new AIDS research data appears in the journal literature.

An important part of your research includes analyzing and studying this data. But you can't afford to spend countless hours searching through thousands of publications every week.

That's why you need ASCATOPICS—the weekly article alerting service that searches the journal literature for you. You can be sure ASCATOPICS will find all the latest AIDS research published each week.

**Get a free copy of our report on AIDS.
Call toll-free 1-800-523-1850,
extension 1405.**

isi[®]

Institute for Scientific Information[®]

3501 Market Street, Philadelphia, PA 19104 U.S.A.

Circle No. 107 on Readers' Service Card

29-5114

**Organize,
Simplify, and Manage
Your Research**
with these three programs for your
IBM PC or Macintosh computer.

Pro-Cite™ (IBM) and the Professional Bibliographic System (PBS) for the Macintosh™: These specialized database and text managers for bibliographic information make it easy to ORGANIZE your references, abstracts, and annotations, and print them according to any bibliographic style you need.

Pro-Search™ (IBM only): An online searching aid for BRS and DIALOG with many time- and money-saving enhancements. Pro-Search can SIMPLIFY searching for both the novice and the experienced searcher.

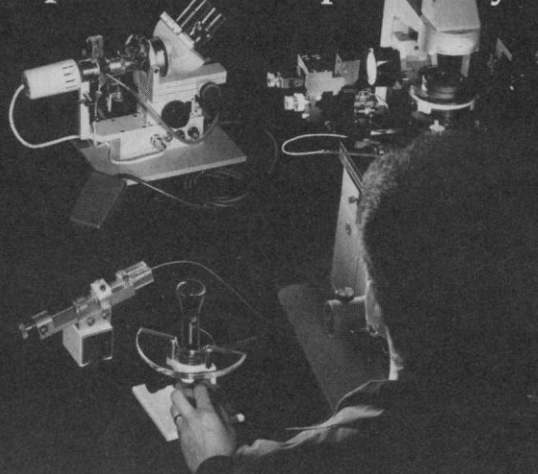
Biblio-Links™: The essential links between online database systems and your own Pro-Cite or PBS databases. MANAGE your downloaded records using Biblio-Links to transfer them directly into Pro-Cite or PBS. No hassles. No manual entry. Biblio-Links are available for BRS, DIALOG, MEDLARS, OCLC, and RLIN.

Call or write for more information.
Personal Bibliographic Software, Inc.
P.O. Box 4250, Ann Arbor, MI 48106
(313) 996-1580

Personal Bibliographic Software, Inc.

Circle No. 159 on Readers' Service Card

INTRODUCING NARISHIGE USA's Complete Micromanipulation System



Narishige USA is the exclusive USA source for Narishige Co., Japan. We sell and service the newest Narishige products through a select group of dealers across the country.

The advantage to you is:

• Immediate Delivery • Local Sales and Service • Exceptional Values • One-Year Warranty

For the name of your local dealer or more information call:



NARISHIGE USA, INC.

One Plaza Road, Greenvale, NY 11548 • (516) 621-4588
(800) 445-7914

Circle No. 49 on Readers' Service Card

Knowledge is Power ONLY IF YOU CAN FIND IT!!

dms4Cite™ **Document Management System For Citations**

Release 4.0 NOW AVAILABLE!

- Professional Bibliographic Database Management System (Formerly **Martz BIBLIOFILE**)
- Search by Author, Title & Key Words, etc.
- Now Stores Abstracts and Full Text
- Renumber Citations within your Manuscript and Format Corresponding Bibliography
- Import Citations & Abstracts from STN/CAS, NLM & BIOSIS among others
- Rated "Best Bet" by Dr. James H. Beach, Science Software Quarterly

Order from: **Sidereal Technologies, Inc.**

263 Center Avenue - PO Box 30 - Westwood, NJ 07675

(201) 666-6262

1-800-544-CITE

\$250 + \$12.50 Fed. Exp. (PO, MC, or Visa)

Circle No. 113 on Readers' Service Card

SigmaPlot™ software creates publication quality charts & graphs for the scientist.

IBM PC and Compatibles

NEW
VERSION 3.1



Create professional graphs for scientific publications, poster sessions, or lectures. Unlike business software, Sigma-Plot contains essential scientific features.

- Automatic error bars
- Multiple graphs per page
- 65,000 points per dataset

- Greek and math symbols
 - Polynomial curve fitting, and more...
- Accepts ASCII and DIF data files from Lotus, dBase, or your own programs. Support for Hewlett-Packard and compatible plotters, HP Laserjets, and selected dot matrix printers. Money-back guarantee.

Free brochure 800-874-1888
In CA 415-924-8640
FAX: 415-924-2850 / Telex: 4931977
In Europe: R.J.A. Honders, Germany
Ph #02101/666268

Jandel
SCIENTIFIC

"Microcomputer Tools
for the Scientist"

■ 65 Koch Road ■ Corte Madera, CA 94925

Circle No. 171 on Readers' Service Card

SCIENCE

Posters

The following posters of Science covers are available:

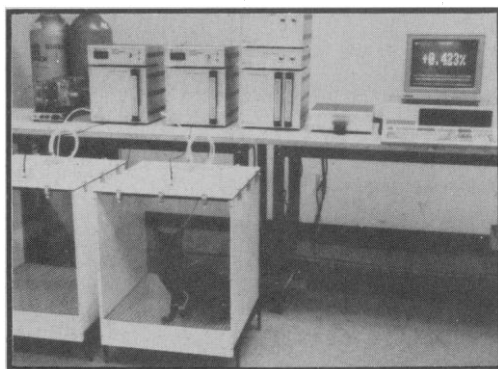
- 9 February 1979, Locomotive in China;
 - 27 July 1979, Lightning over St. Louis;
 - 29 July 1983, Cheetah and cub;
 - 2 December 1983, Snowshoe hare;
 - 23 December 1983, Cathedral window/DNA molecule;
 - 26 September 1986, Neurons in motor cortex;
 - 28 November 1986, Byrd Glacier, Antarctica
- Combination of space covers in scroll format: 1 June 1979, 23 November 1979, 10 April 1981.

Price is \$5.50 each (prepaid)

Write to AAAS Department POST,
1333 H Street, NW, Washington,
D.C. 20005.

O₂ CONSUMPTION / CO₂ PRODUCTION

COMPUTERIZED SYSTEM FOR MEASURING ANIMAL METABOLISM



"Oxymax" System

- * Simultaneous measurements in 1 to 4 chambers.
- * Can be used with small or large subjects (mice to pigs).
- * Utilizes IBM-PC/XT compatible etc. as a controller.
- * Open circuit indirect calorimetry method.
- * Prints/stores results in one minute intervals.
- * Allows for simultaneous measurements of O₂/CO₂ consumption/production, respiration rate, respiratory quotient, animal locomotor activity, food consumption, body temperature and heart rate. 24 hour hands-off operation.
- * Variety of sizes of measuring chambers.
- * Animal exercisers available as an option.

Sample of "Oxymax" Printout

Sample #	Cage #	VO ₂ ml/Kg/Hr	VCO ₂ ml/Kg/Hr	RER	O ₂ %O ₂	CO ₂ %CO ₂	Heat Kcal/Hr	Temp degC	Food g	Resp Vol	-----	Counter	Interface	-----	Time
											HorzActv	HeartBPM	RespRate	BodyTemp	hh:mm:ss
1	1	801	638	0.796	-0.399	+0.332	+1.61	+26.1	+0.2	7.70	213	345	187	37	16:23:25
2	1	772	624	0.808	-0.385	+0.324	+1.56	+26.1	+0.0	8.36	210	330	167	37	16:27:25
3	1	783	646	0.825	-0.392	+0.336	+1.59	+26.0	+0.4	9.33	212	398	153	37	16:31:25

Contact us for more information!

COLUMBUS INSTRUMENTS



950 N. HAGUE AVE., COLUMBUS, OHIO 43204 U.S.A.
PHONE: (614)488-6176 TELEX: 246514 FAX: (614)276-0529

LET LIFE FOOL YOU ONCE AND YOU COULD BE FOOLED FOR LIFE

There was a time when you could buy life insurance and know exactly what your benefits would be down the line. It's not so easy anymore. Today, insurance plans feature complicated investment devices tied to fluctuating interest rates. And while the minimum and maximum amounts payable are fixed, your beneficiary might get less than you planned for. Simple isn't always better, but many insurance experts recommend you look at Term Life Insurance. It pays what it promises...no fancy investment footwork...right up to the termination age.

Which is why the AAAS endorses its own Term Life Insurance Plan—it's the purest and most inexpensive kind of life insurance. Each AAAS member can apply for up to \$240,000 of coverage with generous protection for the family, too.

Interested? Simply contact the Administrator, AAAS Group Insurance Program, 1255 23rd Street, N.W., Suite 300, Washington, D.C. 20037, or call Toll-Free 800/424-9883 (in Washington, D.C. call 202/296-8030). They will be pleased to answer any questions you may have about this valuable member benefit.

THE T³ SCIENTIFIC WORD PROCESSING SYSTEM a powerful WYSIWYG program for PCs and compatibles

"While easy to use, T³ is rich in possibilities, the depth and breadth of which can only be suggested."

- Raoul LePage
Michigan State University

Revising Sample Document Full Keyboards Same as keys Italics
Pg. 1:1 Pos. 1 1 +0.0 4.50 in Line format Single spacing H 0 D 0

WHY TYPE THIS:
$$\phi(\text{equation}) = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

IF YOU WANT THIS:
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

With the T³ Scientific Word Processor, you can directly type mathematics, chemistry, foreign languages, and special characters.

Some examples:

Chemical structure: CC1(C)C(C(C1)C)C

Mathematical formula:
$$\int_{-\infty}^{\infty} e^{-x^2} dx = \int_{-\infty}^{\infty} e^{-(x^2+y^2)} dx dy$$

Text:
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

10:50:40 [status bar]

Scientific Word Processor, you can directly type mathematics, foreign languages, and special characters.

Direct entry of technical text
Full word processing capability
No modes or "mark-up" language
Editor's Choice award winner, PC Magazine, Feb. 25, 1986

TCI Software Research, Inc.
1190-B Foster Road
Las Cruces, NM 88001 USA
(800) 874-2383 • (505) 522-4600

800-874-2383 TCI SOFTWARE RESEARCH, INC.

1190-B FOSTER ROAD • LAS CRUCES, NEW MEXICO 88001 • USA • (505) 522-4600 • TELEX: 317629

Circle No. 134 on Readers' Service Card

IF WE CAN KEEP A SEVERED HEAD ALIVE...

by Chet Fleming

An analysis of U.S. Patent 4,666,425 ("Device for Perfusing an Animal Head," issued May 1987) and the scientific, legal, ethical, and religious issues surrounding transplanted heads, perfused brains, and perfused heads. With specific proposals for using existing agencies to create and enforce reasonable controls on this type of controversial research. Additional chapters discuss the broader interactions between science, ethics, and law, and contain proposals for controlling dangerous or threatening technology and for stimulating beneficial technology.

Hardcover, 461 + xxxiv pages, with footnotes, appendices, index, and a reprint of U.S. Patent 4,666,425.

\$12.95 US plus \$2.00 postage and handling.
Missouri residents add 6.1% sales tax.

POLINYM PRESS
P. O. Box 22140
St. Louis, MO 63116

Circle No. 129 on Readers' Service Card