

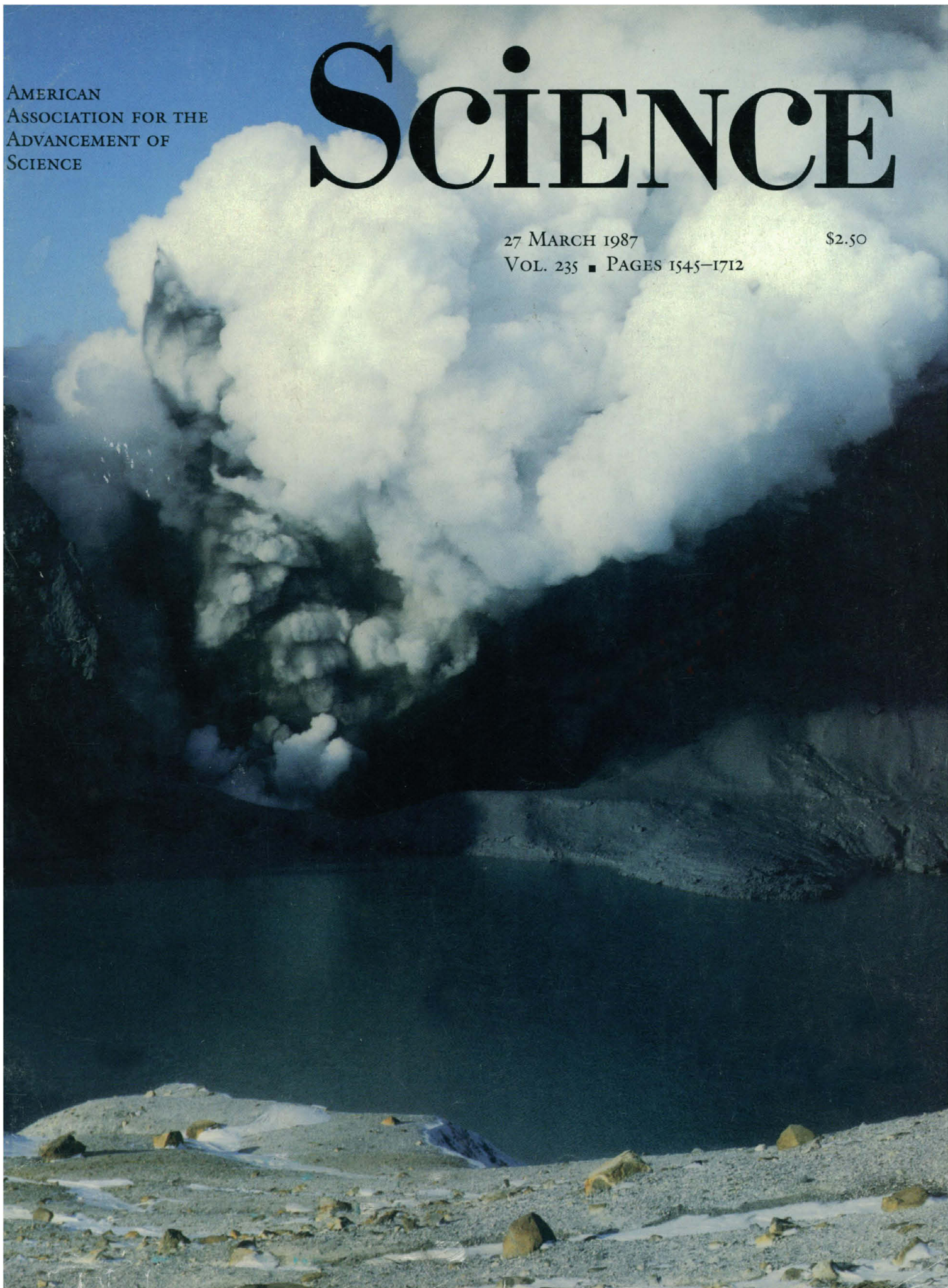
AMERICAN  
ASSOCIATION FOR THE  
ADVANCEMENT OF  
SCIENCE

# SCIENCE

27 MARCH 1987

\$2.50

VOL. 235 ■ PAGES 1545-1712



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

BECKMAN

RPM  
3750

SPEED

TIME IN MINUTES

BRAKE

DOOR

POWER

HIGH

OFF

LOW

OPEN

ON

OFF

GPK Centrifuge

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



Available Summer 1987.



Available Spring 1987.



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. 172 on Readers' Service Card

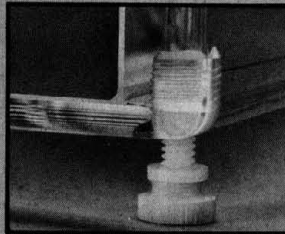
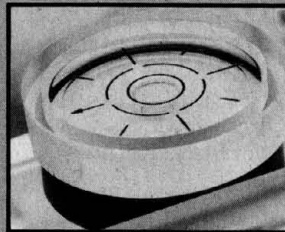
Surveying DNA Fragments?

# E-C wants to level with you.

It's been difficult to survey DNA fragments obtained via restriction enzymes. Uneven buffer levels. Migration power variations. Make-do equipment below usual lab standards.

Now, E-C offers two new submarine agarose gel systems for DNA fragment survey. The EC MiniCell and EC MaxiCell. Difference? The MaxiCell handles larger samples and other separations such as TLC plates and immunoelectrophoresis. Costs a bit more.

*Helps you do your level best.* Both cells have leveling feet and a leveling bullssey which can't get lost or



misplaced. Buffer levels are easy to adjust. No spills or waste.

Other important features: UV-transparent buffer trays, platinum electrodes, slide-on anti-spill electrical safety cover.

Even the price is low-level. \$175 for the EC370 MiniCell and \$260 for the EC360 MaxiCell. Both systems compatible with EC103 Power Supply (250V, 100mA) at \$225 and EC105 Power Supply (250V, 300mA) at \$275.

Call Technical Service for details. The toll-free number is 1-800-624-2232 (Ext. 67). In Florida call 1-800-282-7932 (Ext. 67).



E-C Apparatus Corp.  
3831 Tyrone Boulevard N.  
St. Petersburg, FL 33709  
813-344-1644 Telex: 51-4736 HALA

Circle No. 158 on Readers' Service Card

1551 This Week in *Science*

## Editorial

1553 WILLIAM D. CAREY

## Perspective

1555 Why Recycle Plutonium?: D. ALBRIGHT AND H. FEIVESON

## Letters

1561 NIH Fraud Guidelines: M. R. ROSEN AND B. F. HOFFMAN; G. J. GALASSO ■  
SSC and SDI: H. BIALY ■ Late Cretaceous Atmospheric Oxygen:  
M. A. S. McMENAMIN AND D. S. McMENAMIN ■ Nucleic Acid Database  
Management: D. G. GEORGE, L. T. HUNT, W. C. BARKER ■ Saturated Fat  
Avoidance: R. PETO

## News & Comment

1563 How Safe Savannah River Reactors?  
1564 OTA: Property Right, Donor Consent Factors Cloud "Gifts" of Human Tissue  
1565 Shake-up Announced for Soviet Academy  
1566 NIMH Finds a Case of "Serious Misconduct"  
1567 CERN Panel Backs New Accelerator  
A \$2.5-Billion Acid Rain Plan  
1568 Company Offers to Buy NASA a Rocket  
U.S., Soviets Renew an Exchange  
Tax Relief Sought for Oil Industry  
1569 NAE Elects New Members  
1570 *Briefing*: Frank Press Relected President of NAS ■ FDA Approves AZT ■  
Technology Study Gets Under Way ■ Chapter 11 for USA, Inc. ■  
*Science* Wins Olive Branch ■ Soviet Patents

## Research News

1571 A Superconductivity Happening  
1572 Progress on Fermat's Famous Math Problem  
1574 Brain Damage by AIDS Under Active Study ■ Candidate AIDS Vaccine

## Articles

1600 Uncertainties in Building a Strategic Defense: C. A. ZRAKET  
1607 Water-Quality Trends in the Nation's Rivers: R. A. SMITH, R. B. ALEXANDER,  
M. G. WOLMAN  
1616 Variable Number of Tandem Repeat (VNTR) Markers for Human Gene  
Mapping: Y. NAKAMURA, M. LEPPERT, P. O'CONNELL, R. WOLFF, T. HOLM,  
M. CULVER, C. MARTIN, E. FUJIMOTO, M. HOFF, E. KUMLIN, R. WHITE

## Research Articles

1622 Oncogenesis of the Lens in Transgenic Mice: K. A. MAHON,  
A. B. CHEPELINSKY, J. S. KHILLAN, P. A. OVERBEEK, J. PIATIGORSKY,  
H. WESTPHAL

■ **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 © 1987 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 Phreatic explosion occurred on 29 December 1982 at Yugama Crater Lake, Kusatsu-Shirane volcano, Japan. The variation of polythionates in the lake water is a good indicator for predicting impending eruption of the volcano. See page 1633. [Masayuki Shimoya, Tsumakoi High School, Gunma, Japan]

## Reports

- 1629 Edge Surfaces in Lithographically Textured Molybdenum Disulfide: C. B. ROXLO, H. W. DECKMAN, J. GLAND, S. D. CAMERON, R. R. CHIANELLI
- 1631 Solar Irradiance Change and Special Longitudes Due to  $r$ -Modes: C. L. WOLFF AND J. R. HICKEY
- 1633 Correlation of Volcanic Activity with Sulfur Oxyanion Speciation in a Crater Lake: B. TAKANO
- 1636 Heritable Somatic Excision of a *Drosophila* Transposon: G. J. BRYAN, J. W. JACOBSON, D. L. HARTL
- 1638 Human Lipoprotein Lipase Complementary DNA Sequence: K. L. WION, T. G. KIRCHGESSNER, A. J. LUSIS, M. C. SCHOTZ, R. M. LAWN
- 1641 Ubiquitin Is a Component of Paired Helical Filaments in Alzheimer's Disease: H. MORI, J. KONDO, Y. IHARA
- 1644 Regional Changes in Calcium Underlying Contraction of Single Smooth Muscle Cells: D. A. WILLIAMS, P. L. BECKER, F. S. FAY
- 1648 A New Probe for the Diagnosis of Myotonic Muscular Dystrophy: R. J. BARTLETT, M. A. PERICAK-VANCE, L. YAMAOKA, J. GILBERT, M. HERBSTREITH, W.-Y. HUNG, J. E. LEE, T. MOHANDAS, G. BRUNS, *et al.*
- 1651 Polypeptide Sequences Essential for RNA Recognition by an Enzyme: L. REGAN, J. BOWIE, P. SCHIMMEL
- 1654 Electrical Responses of Eggs to Acrosomal Protein Similar to Those Induced by Sperm: M. GOULD AND J. L. STEPHANO
- 1656 Detection of Rift Valley Fever Viral Activity in Kenya by Satellite Remote Sensing Imagery: K. J. LINTHICUM, C. L. BAILEY, F. G. DAVIES, C. J. TUCKER
- 1659 Signaling for Growth Orientation and Cell Differentiation by Surface Topography in *Uromyces*: H. C. HOCH, R. C. STAPLES, B. WHITEHEAD, J. COMEAU, E. D. WOLF

## Book Reviews

- 1681 Cosmic Debris, *reviewed by* U. B. MARVIN ■ The Hippocampus, L. NADEL ■ Fire Ants and Leaf-Cutting Ants, N. F. CARLIN ■ Prehistory in the Pacific Islands, R. L. KIRK ■ Books Received

## Products & Materials

- 1687 Graphics Software ■ Washer for Western Blot Testing ■ Software Calculator ■ Radioisotope Detector ■ Custom-Built Coldrooms ■ Water Purification System ■ Eigenvalue Software ■ Media Preparation System ■ Literature

*Author Index for Volume 235 is found on pages i-x*

*Information for Contributors is found on pages xi-xii*

### 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*

William D. Carey  
*Executive Officer*

### Editorial Board

Elizabeth E. Bailey  
David Baltimore  
William F. Brinkman  
Phillip E. Converse  
Joseph L. Goldstein  
James D. Idol, Jr.  
Leon Knopoff  
Seymour Lipset  
Oliver E. Nelson  
David V. Ragone  
David M. Raup  
Vera C. Rubin  
Larry L. Smarr  
Solomon H. Snyder  
Robert M. Solow  
James D. Watson

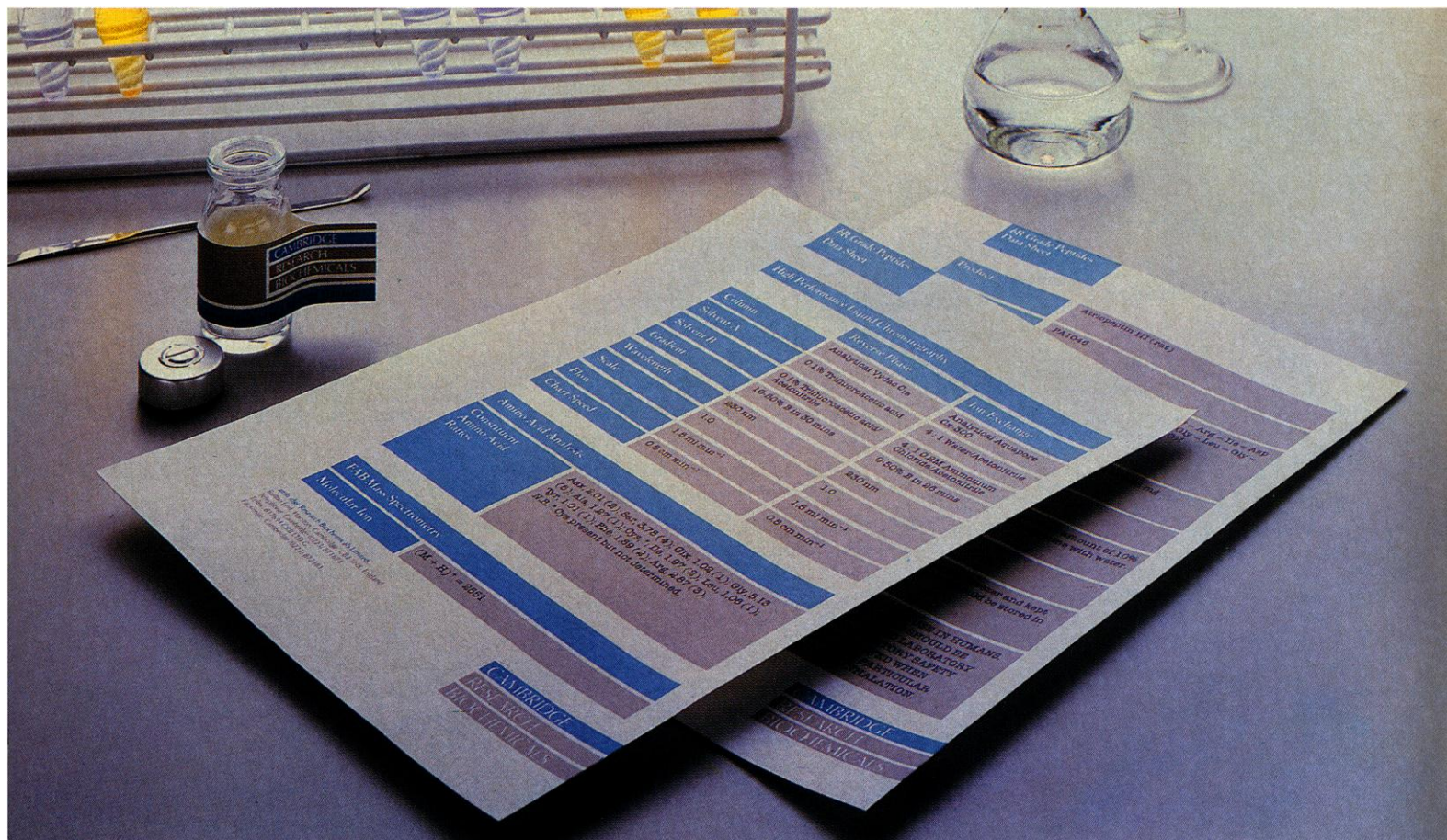
### Board of Reviewing Editors

John Abelson  
Qais Al-Awqati  
James P. Allison  
Don L. Anderson  
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

Corey S. Goodman  
Stephen J. Gould  
Richard M. Held  
Gloria Heppner  
Eric F. Johnson  
Konrad B. Krauskopf  
I. Robert Lehman  
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  
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

# Free with every full analysis from Cambridge...



## ...a bR grade peptide.

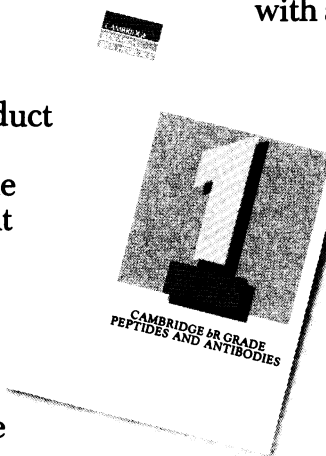
The new range of 'biological reagent', (bR grade) peptides from Cambridge Research Biochemicals guarantees you a truly defined product for consistent, accurate results.

Setting the standard in peptide specification, each bR grade reagent is supplied by net peptide weight as determined by amino-acid analysis and enables standard solutions to be made directly from each vial.

Each product comes complete

with a full analysis including amino-acid composition, high resolution HPLC and FAB mass spectrometry data confirming molecular weight, together with detailed storage and handling information.

Send now for your free copy of the new 'Cambridge bR Grade Peptides and Antibodies' catalogue which gives full details on over 100 products and custom synthesis services, and discover how bR grade peptides pass with honours at Cambridge.



Circle No. 88 on Readers' Service Card

**CAMBRIDGE**  
**RESEARCH**  
**BIOCHEMICALS**

## This Week in SCIENCE

### Plutonium recycling

SIX European countries and Japan have made plans to recycle large quantities of plutonium for use in breeder and light water reactors (page 1555). Plutonium is the "fissile" agent of nuclear weapons and is generated in commercial reactors. In their Perspective, Albright and Feiveson urge the international community to dissuade interested countries from their plans to recycle plutonium. It was once thought that reprocessing would help in the disposal of radioactive waste, but it now appears that it is no more difficult to dispose of spent fuel than reprocessed material. Some countries became interested in plutonium reprocessing in an effort to develop energy independence, but the energy savings from recycling in light water reactors are minimal. (Breeder programs have ground to a halt worldwide.) Recycling also produces no economic benefit. Current recycling plans call for transporting various grades of plutonium first from the site at which it is generated to a reprocessing center, then to a fuel fabrication facility, and eventually to a new reactor location: security measures of "nightmarish" complexity are needed to protect the traveling plutonium from falling into the hands of terrorists. Countries in which reprocessed plutonium is available would be able to develop nuclear weapons clandestinely up to the point at which fissile materials need to be added; without having to address directly whether they want a nuclear capability, such countries would be just weeks away from having a nuclear arsenal. Recycling of plutonium may be a process for which the risks greatly outweigh the benefits.

### Lens tumors

AN oncogene has been used to experimentally induce tumors in the lens of the eye; the lens is a tissue in which malignant tumors are not known to arise naturally (page 1622). Mahon *et al.* attached the oncogene (the large-T antigen of SV40 vi-

rus) to the regulatory genes for  $\alpha$ A-crystallin; this construct targets the expression of the oncogene to the lens. The T antigen was expressed when the crystallin genes were activated early in development. The lens was profoundly altered in animals that had received the construct: lens fiber cells did not differentiate normally although epithelial cells did; the lens, usually transparent, was white and opaque. Invasive tumor tissue and blood vessels ultimately replaced the lens, breaking through the back and the front of the eye. This system will be useful for studying how this and other oncogenes are activated; it may also provide insight into what features of the lens normally prevent tumors from growing there. The lens is in some way privileged because tumors develop in all other regions of the eye.

### Predicting volcanic activity

IT may be possible to forecast activity for some volcanoes that house crater lakes (cover) (page 1633). Takano used liquid chromatography techniques to monitor polythionate ions, sulfate ions, and other chemical species in the waters of a crater lake (Yugama) at the summit of Japan's Kusatsu-Shirane volcano. As volcanic activity increased, so did the ratio of sulfur dioxide to hydrogen sulfide; these gases seep up onto the lake floor, and, from them, new chemical species are generated in the water. As the chemical balance shifted, polythionates were degraded to elemental sulfur and sulfate ions; 2 months before Yugama erupted in 1982, polythionates had dropped to undetectable levels. Polythionate levels continued to fluctuate, reflecting the activities (eruptions and swarming earthquakes) occurring at the lake bottom. If eruptions can be predicted with sufficient lead time, precautionary measures could be taken; it might then be possible to minimize the disastrous consequences to property and life of the toxic gases released by the volcano and of the lava and mud streams that barrel over inhabited areas.

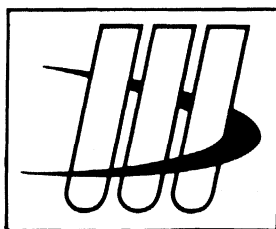
### Acrosomal protein and fertilization

ONE of the earliest responses of an egg of the marine worm *Urechis* to a sperm may be induced by acrosomal protein, a sperm surface component that comes into contact with the egg before the two gametes actually fuse (page 1654). The "signal" appears to initiate the fertilization potential, a change in electric potential in the egg's membrane; membrane channels open, and the egg is soon refractory to other sperm. Gould and Stephano isolated acrosomal protein from *Urechis* sperm. When *Urechis* eggs were exposed to acrosomal protein, sodium channels opened in the surface membrane. The electric responses to the protein were similar in form and amplitude to those induced by whole live sperm and were similarly dependent on calcium ions. Acrosomal protein may modify the egg's surface charge, change the egg's surface structure by entering its lipid bilayer, or in some other way induce the fertilization potential.

### Epidemiology by satellite

SATELLITE data that show patterns of plant growth in sub-Saharan Africa appear to be useful for predicting when Rift Valley Fever (RVF) virus will be most active (page 1656). Both flourishing of vegetation and peak viral activity are directly dependent on rainfall; when mosquito breeding grounds flood, encysted eggs that carry the virus are stimulated to hatch into disease-transmitting mosquitoes. These bite sheep, cattle, and people, and many abortions and deaths may result. Linticum *et al.* compared vegetation patterns (measured with advanced very high resolution radiometers on board meteorologic satellites) with prevalence patterns of RVF virus-infected mosquitoes in Kenya. The rise in infected mosquitoes precedes the outbreak of RVF; therefore, it may be possible to scan the vast areas harboring this virus and to institute measures for controlling outbreaks of RVF.

# INTRODUCING AN UNPRECEDENTED CONCEPT IN THE LITERATURE OF SCIENCE:



## THE ISI ATLAS OF SCIENCE®

### **INNOVATIVE. TIMELY. UNIQUE.**

That's the *ISI Atlas of Science*, an exciting new series of publications that explores the present and future direction of research in science, medicine, and technology. The *Atlas* combines the power of computerized citation analysis with the expert interpretation of leading researchers to guide you through the landscape of science, helping you understand what is happening in science research today . . . and where it might lead tomorrow.

The *Atlas* series will consist of 12 sections, each focusing on a distinct area of scientific research. The first section, the *ISI Atlas of Science: Pharmacology*,

is available now. Over the next four years, 11 additional *Atlas* sections will begin regular publication.

A yearly subscription to each *Atlas* section consists of four quarterly issues, each containing 20-30 surveys analyzing the latest research in the topic covered. Institutional subscriptions also include an annual cumulation containing all surveys for that year, plus extensive indexes and reference materials.

### **Flexible . . .**

A variety of subscription options are available for the *ISI Atlas of Science*, designed to meet the research and budgetary needs of individuals, departments, and small or large libraries. And, for a limited time, subscribers can take advantage of our Charter Subscription

Program and receive all 12 sections of the *Atlas* as they become available . . . at significantly reduced rates!

### **Explore your options . . .**

To explore the variety of *ISI Atlas of Science* options available, call toll-free, 1-800-523-1850, extension 1405. In Pennsylvania and outside the United States, call 215-386-0100, extension 1405. We'll send you a complimentary information package, including a detailed brochure and sample articles from the *ISI Atlas of Science: Pharmacology* . . . at no obligation.

**FROM THE PUBLISHERS OF  
CURRENT CONTENTS®  
AND THE  
SCIENCE CITATION INDEX®.**

**isi®**

Institute for Scientific Information®

©1987 29-4679

3501 Market Street, Philadelphia, PA 19104 U.S.A., Telephone: (215) 386-0100, ext. 1405, Cable: SCINFO, Telex: 84-5305  
European Branch: 132 High Street, Uxbridge, Middlesex UB8 1DP, United Kingdom, Telephone: 44-895-70016, Telex: 933693 UKISI  
Circle No. 189 on Readers' Service Card



## 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*)

## EDITORIAL STAFF

**Managing Editor:** Patricia A. Morgan

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

**Senior Editors:** Eleanor Butz, Ruth Kulstad

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

**Letters Editor:** Christine Gilbert

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

**This Week in Science:** Ruth Levy Guyer

**Chief Production Editor:** Ellen E. Murphy

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

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

**Production Manager:** Karen Schools

**Graphics and Production:** 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

**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); U.K., Europe: Nicholas Jones, +44(0647)52918.

Instructions for contributors appears on page xi of the 27 March 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.

## William D. Carey

"I am abdicating, not retiring," said William D. Carey, executive officer of the American Association for the Advancement of Science, as he decided to step down from his post as the association's administrative head. That is appropriate phrasing after a reign that has been both regal and constitutional. A great deal of the shape of the current AAAS has been sculpted by William D. Carey.

The AAAS, founded in 1848, is one of the largest and most sprawling associations for science in the world. It has 133,000 direct members and 285 affiliated societies and academies of science. It was already a large organization when Carey took over in 1975, but new projects and significant new emphases have been created by his energy and enthusiasms. A Research & Development Colloquium in which leaders of the major funding agents for science, such as the National Science Foundation, the National Institutes of Health, and the Department of Defense, exchange views on their budgets with interested scientists and their representative organizations is now a major annual event in Washington. A new project in science and mathematics education, entitled Project 2061—Education for a Changing Future, has been launched to help provide knowledge that will lead to more and better scientists in the years ahead. A daring opening to scientists in China before normalization in relations between the U.S. and Chinese governments has led to a productive relation between the AAAS and the China Association for Science and Technology.

A Committee on Opportunities in Science has been effective in developing information for minorities, the handicapped, and women in science, great reservoirs of underutilized talent in our country. A Committee on Scientific Freedom and Responsibility, initiated by Carey, has been concerned with the flow of scientific information and the civil rights of scientists in countries where oppression is endemic. A Committee on Arms Control and National Security sponsors symposiums for experts in Washington and elsewhere.

Individuals are often tested more by battles lost than by battles won. Carey launched a new magazine, *Science 80*, to fill a void in science education for the layman. It was an editorial success and a financial failure, but there is little doubt that its initiation activated others and led to expanded coverage of science in the media. It was an honorable adventure and typical of Carey's willingness to take risks.

The new initiatives did not remove Carey from commitment to the important ongoing activities of the AAAS: the long-standing cooperation between the AAAS and the Westinghouse Educational Foundation in which awards are presented to outstanding science journalists, the extensive cooperation with the National Academy of Sciences, testimony at congressional committees, service on boards, and personal relationships that add to the presence of science in the seats of government. He was responsible for bringing in a new editor of *Science* with encouragement to expand the readership, scope, and influence of the magazine even beyond the excellent base established by Philip H. Abelson.

A recitation of detailed accomplishments and procedural initiatives is only part of any story in the achievements of an executive officer. A delocalized society of busy professionals can have three kinds of leaders: those who quietly go about the mundane work of their organizations, risking little and expanding little; those who in a dictatorial manner lead a large but naive giant down paths it does not completely comprehend; and those who discern what the needs and desires of the giant are and become the pathfinders. Bill Carey was the latter. He was faithful to his beliefs in the integrity and importance of science and dedicated to increasing its scope and power. A great deal of his effectiveness was derived from his personal charm and his genuine concern for what he frequently called "the family of the AAAS." In that regard, one of his proudest accomplishments was the consolidation of the diverse activities of the AAAS in one building where "the family" could interact.

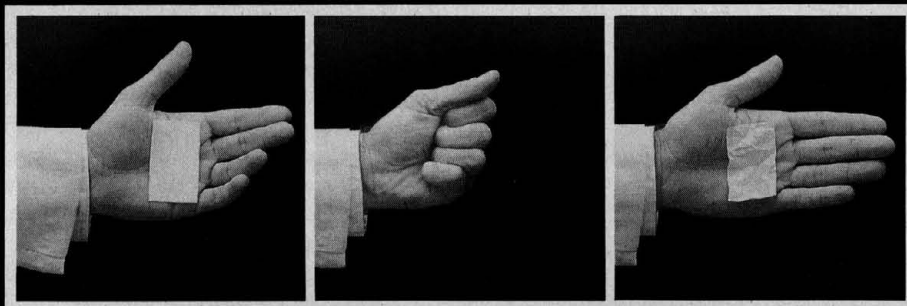
For his activities in behalf of science, he has received many awards—the National Civil Service League Award, the Rockefeller Public Service Award, the Public Welfare Medal of the National Academy of Sciences, the Distinguished Service Award of the National Science Foundation. Bill Carey is not retiring. He is stepping up his other activities as he turns over an enhanced directorship to an able successor. He leaves behind a landscape of good deeds for science further brightened by the legion of friends who wish him well.

—DANIEL E. KOSHLAND, JR.

The performance of nitrocellulose  
plus unsurpassed strength

Introducing

# NitroPlus™ 2000



## A Breakthrough, Not A Breakdown

**The first supported nitrocellulose blotting membrane that virtually eliminates data loss from breakage.**

If the fragile nature of nitrocellulose membranes has ever caused you to lose data (and your patience) from Southern, Northern or Western blots, NitroPlus 2000 from MSI is the beneficial breakthrough you've needed. It's guaranteed not to break during standard transfer procedures (when used in accordance with applicable instructions).

NitroPlus 2000 provides the same protein and nucleic acid binding capacity as nitrocellulose, and allows you to use the same blotting methods. It's ideal for reprobing and remains intact through multiple stripping and washing steps. You obtain the classic performance of nitrocellulose with the handling and strength characteristics of nylon membranes.

NitroPlus 2000 is now available in 0.2 $\mu$ m and 0.45 $\mu$ m pore sizes; in rolls, discs, rectangles and squares.

**Discover a breakthrough that saves time and money while eliminating the frustration of membrane breakdown: NitroPlus 2000 from MSI. Call 617-366-8212 and request your free sample today.**

**Also available from Fisher Scientific.**

NitroPlus 2000 is the newest innovation from MSI, the world's only manufacturer of both cellulosic and nylon membranes. MSI also offers MAGNA NYLON 66, biochemically optimized MAGNAGRAPH Nylon, and traditional nitrocellulose membranes for nucleic acid and protein binding. All are available in a choice of ten commonly-ordered sizes.

**msi** MICRON SEPARATIONS INC.

135 Flanders Street  
P.O. Box N  
Westboro, Massachusetts 01581  
617-366-8212  
Telex 4974298

Announcing a new international journal for current research in paleobiology

# HISTORICAL BIOLOGY

An International Journal of Paleobiology

## Editor

### Eric Buffetaut

UA 720 du CRNS, Laboratoire de Paleontologie des Vertebres, Université Paris VI, 4 Place Jussieu, 75252 Paris, Cedex 05, France

## Co-editors

### Karl Flessa

Department of Geosciences, University of Arizona, Tucson, Arizona 85721, USA

### Anthony Hallam

Department of Geological Sciences, University of Birmingham, Birmingham B15 2TT, UK

## Editorial Board

Michael Benton (UK) • David Bottjer (U.S.A.) • W.G. Chaloner (UK) • R.A. Fortey (UK) • Itaru Hayami (Japan) • Ella Hoch (Denmark) • Antoni Hoffman (Poland) • Li Chuan-kuei (China) • Wolf-Ernst Reif (FRG) • Bruce Runnegar (Australia) • Jan Smit (The Netherlands)

## Aims and Scope

**Historical Biology** is a new international journal intended to provide a forum for current research in the rapidly expanding field of paleobiology. It will contain original research reports, short communications and review articles on the history of life through geological time, and the biology of past organisms showing fossils as the remains of beings that have once been alive. Unlike other paleontological journals, it will emphasize the interpretive rather than the descriptive, systematic or stratigraphic aspects of paleontological research. International in character and interdisciplinary in scope, the journal's extensive range of topics will include paleobiology, paleoecology, evolutionary and functional morphology, phylogeny, historical biogeography, evolutionary processes and patterns, and extinction phenomena, as well as molecular paleontology. There will be occasional single topic issues, sometimes covering the proceedings of conferences.

## A Call for Papers

The editors welcome the submission of papers, short communications, review articles, or book reviews relating to all aspects of paleobiology. Papers may be submitted to the editor or the co-editors for consideration. Please contact Harwood for notes for contributors and additional information.

SEND TODAY TO RESERVE YOUR FREE SAMPLE ISSUE  
harwood academic publishers  
P.O. Box 786 Cooper Station, New York, NY 10276, USA  
P.O. Box 197, London WC2E 9PX, UK

# Become a Schleicher customer. No purch

**Y**ou never know when you'll need advice.

On filtration. Transfer and immobilization of nucleic acids or proteins. Affinity membrane technology. Separation science.

Talk to Schleicher & Schuell. Even if you've never used an S&S product.

You see, you don't have to be an S&S "customer" to benefit from our expertise in the life sciences.

Anyone with a question or comment is welcome to call us. With absolutely no strings attached. And talk to us about what interests us most - your work.

Because our goal isn't just to sell products.

It's to provide you with the tools you need to make your research produce better, more consistent results.

## Technical help, as close as your phone.

S&S technical service reps are on the job, every working day, to provide one-to-one, toll-free assistance with products and protocols.

And they have a number of resources at their disposal.

Including a database containing 25 years of protocols and research literature references - research using S&S products.

And lab facilities in which protocols can be tested.

## Information and literature on the latest techniques and breakthroughs.

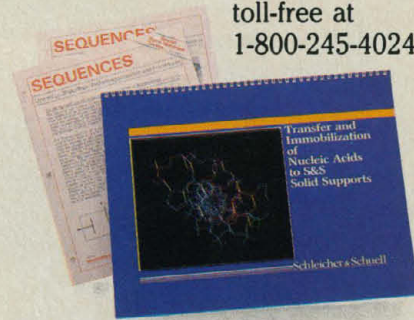
With all of the literature we print, you'd think S&S was a publishing company.

Everything we offer is designed to keep you informed about what's happening in the industry, and at S&S.

That includes the S&S "Sequences" newsletter. Newly

revised protocols for "Southern" and "northern" transfers (a "western" transfer protocol is forthcoming). And data sheets on all major S&S products.

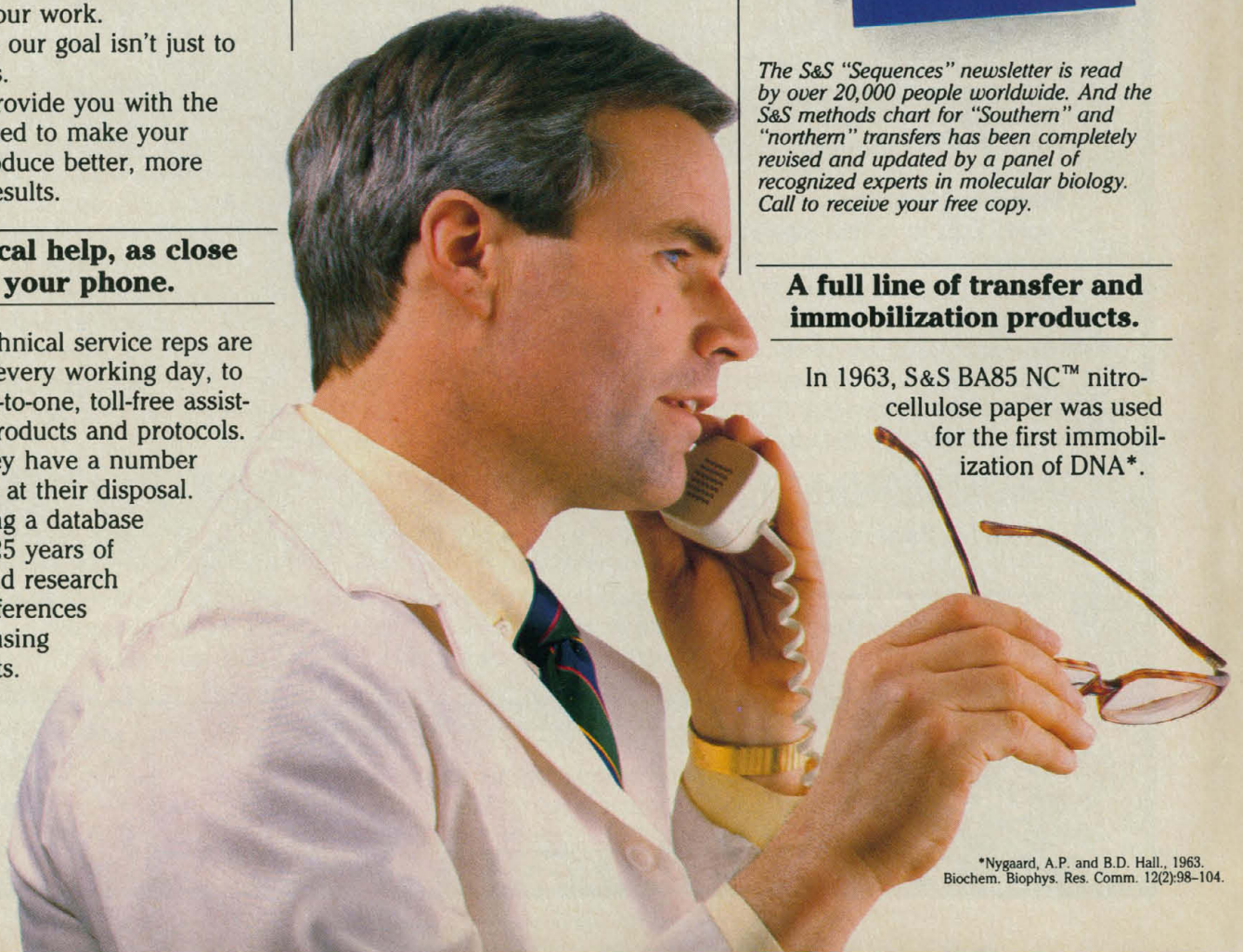
And everything we publish is available - free. Simply by calling our customer service department, toll-free at 1-800-245-4024.



The S&S "Sequences" newsletter is read by over 20,000 people worldwide. And the S&S methods chart for "Southern" and "northern" transfers has been completely revised and updated by a panel of recognized experts in molecular biology. Call to receive your free copy.

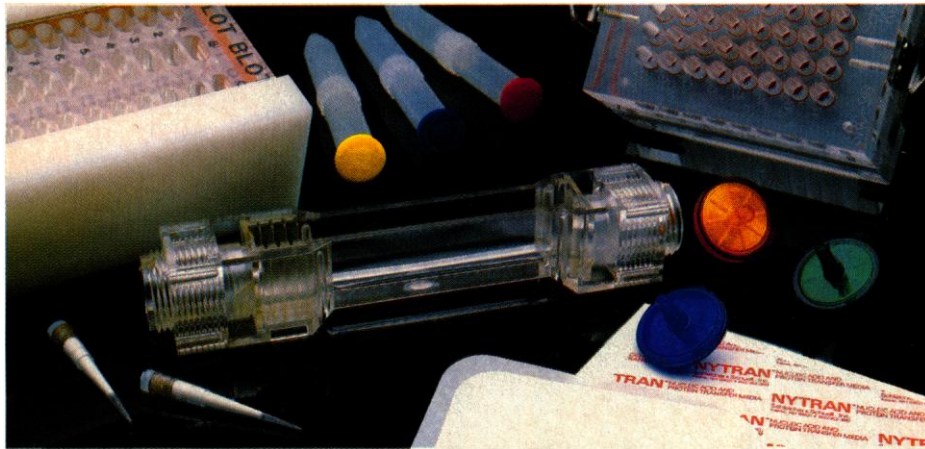
## A full line of transfer and immobilization products.

In 1963, S&S BA85 NC™ nitro-cellulose paper was used for the first immobilization of DNA\*.



\*Nygaard, A.P. and B.D. Hall., 1963. Biochem. Biophys. Res. Comm. 12(2):98-104.

# Schleicher & Schuell No glue necessary.



Products proven through years of lab use. Call for free technical information and pertinent specifications concerning S&S products.

Since then, BA85 has become the media-of-choice for transfer and immobilization of DNA, RNA, and proteins.

This experience goes into our other transfer and immobilization membranes.

Nytran® positively charged nylon membrane, S&S uncharged nylon membrane, S&S glass fiber filters, plus Transa-bind® covalent binding and ion-exchange membranes.

---

### Look to S&S for all of your general separation science needs.

---

Because research does not live by transfer and immobilization alone, we make a whole range of filtration and life science research products.

S&S papers and membranes have a range of applications – from tissue typing to radiation monitoring to pH measurement.

Plus S&S surface-activated and derivatized media are used widely for clinical body fluid specimen collection and immobilization. And are a critical component in many clinical test kits and devices.

---

### Research and development to make your life easier.

---

Like you, we're always in the lab. Improving protocols. Developing new membranes and devices.

Some of our latest developments may change the way you work.

Like the new S&S cell harvester which can process 20 96-well plates in the time that it once took to do one.

Other S&S developments have changed the way the world lives.

S&S #903 specimen collection paper has been used to screen every child born in the U.S. during the last 20 years for inborn metabolic disorders.

Another example, a joint research project with a major pharma-

ceutical company resulted in a new way of testing for antibodies. Our contribution: a customized membrane that made affinity to specific antigens possible.

Working with companies to develop new and innovative customized products is a continuing goal at S&S.

---

### Talk to us.

---

We want to hear from you. We welcome your comments and questions. Write to Schleicher & Schuell, Inc., Keene, NH 03431. Or call us at **1-800-245-4024**.

You won't have to buy a single S&S product to tap our 60 years of experience. Or to receive a product



*Before an S&S product reaches your lab, it has to measure up in ours. S&S scientists work in cooperation with a number of university labs across the country.*

sample and a piece of literature. Or talk to us about your current project.

Of course, we'd like you to buy our products.

And after talking to us, you just might feel the same way.

## Schleicher & Schuell

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

Circle No. 168 on Readers' Service Card

Visit us at FASEB, Booth #1119, 1121

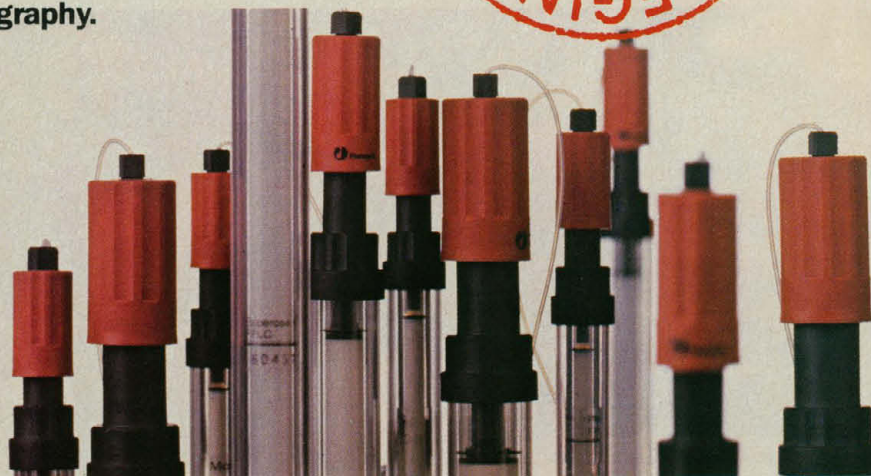
# MEDIA FOR FPLC:

## PEAK PERFORMANCE



Selectivity, capacity, and long life are three simple reasons why so many researchers have already chosen FPLC® for high performance liquid chromatography.

With our media you can achieve the resolution you need — even with closely related small biomolecules such as amino acids or nucleotides. Our media have selectivities specifically designed for the separation of biomolecules — from macromolecular complexes to amino acids. They show outstanding capacity and allow easy scale-up to almost any level. Typical recoveries are greater than 90%.

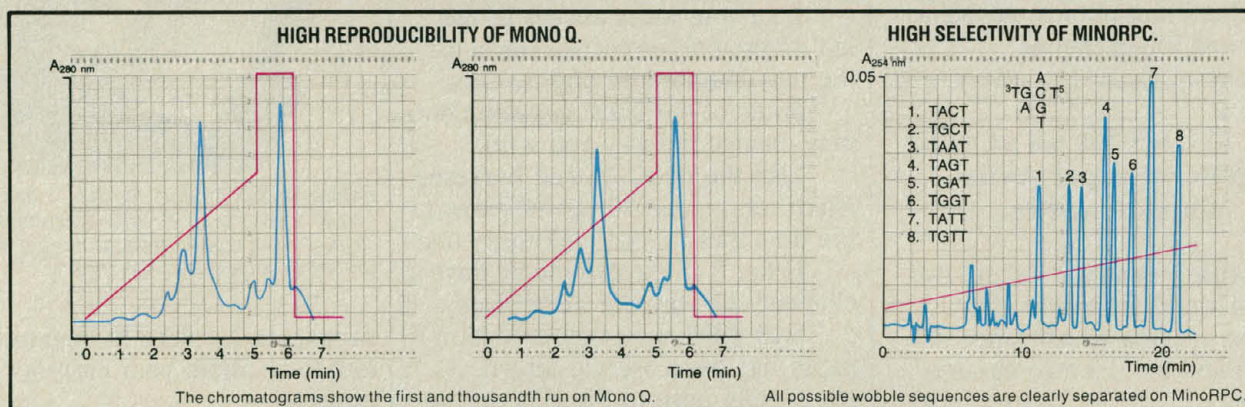


And they provide reproducible results over and over again . . . 1,000 identical runs have been reported on the FPLC System.

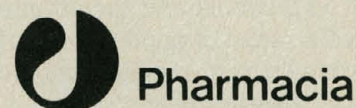
Choose from the wide range of high performance prepacked columns and media covering the key chromatographic techniques.

- Ion exchange — Mono Q® and Mono S®
- Chromatofocusing — Mono P®
- Gel filtration — Superose® 6, Superose® 12 and Fast Desalting Column
- Hydrophobic interaction — Phenyl Superose® and Alkyl Superose®
- Reversed phase — ProRPC™, PepRPC™ and MinoRPC™

All give you the unparalleled separation power and high quality you expect from Pharmacia.



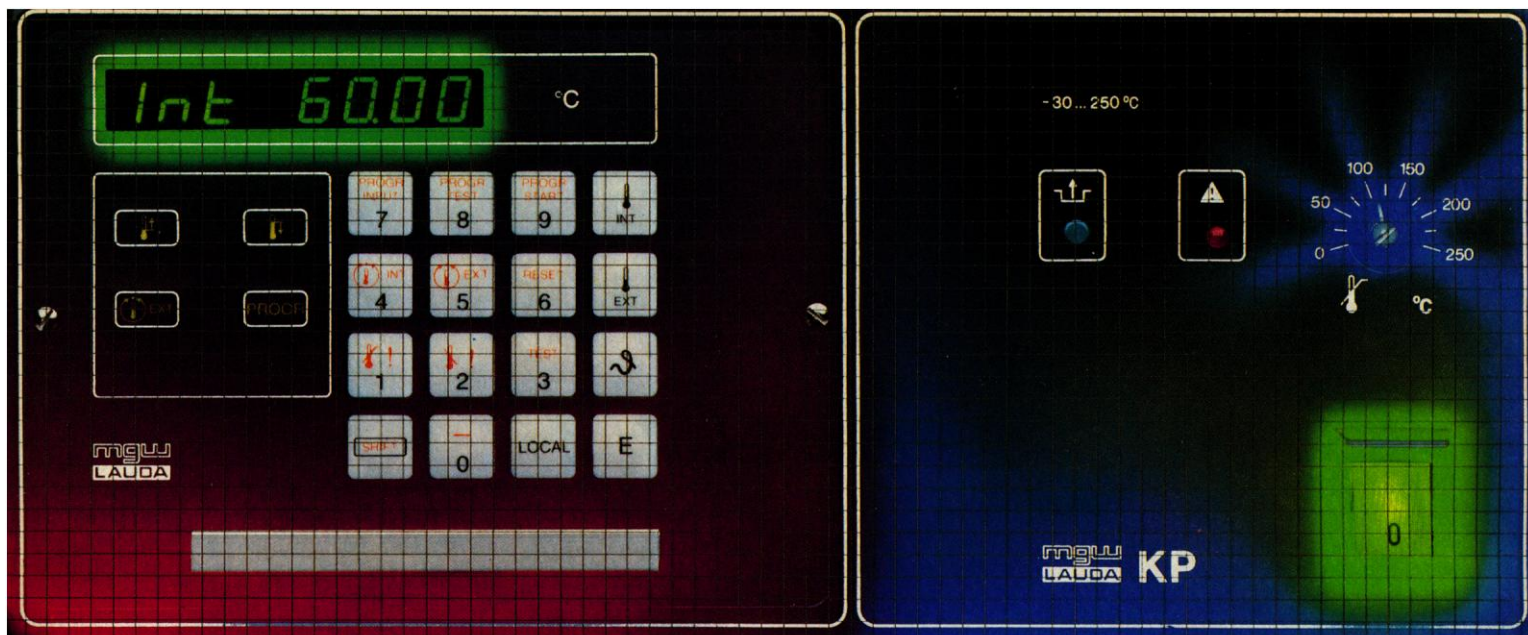
So when you need peak performance and want to save time and money, get the chromatography experts on the line! Request your copy of the new "FPLC: Media and Column Guide for High Performance Separation of Biomolecules".



Laboratory Separation  
Piscataway, New Jersey 08854  
Information: (800) 526-3618  
In NJ: (201) 457-8000

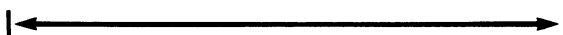
Pharmacia products will be on display at FASEB—Booths 105, 107, 109, 204, 206, 208 In NJ: (201) 457-8000

710



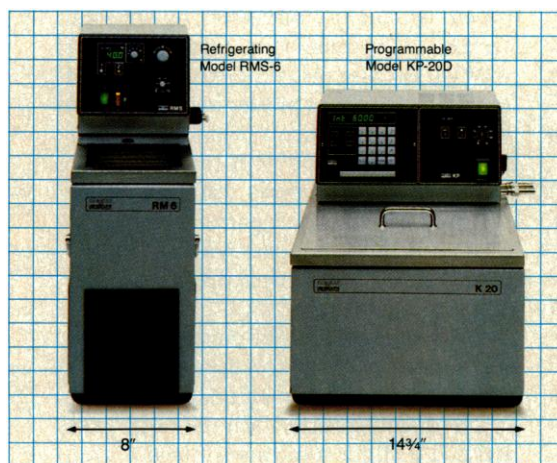
# Lauda circulators give you the highest technology in temperature control.

## Even if you're low on space.



For the highest technology in temperature control, choose a Lauda Constant Temperature Circulator. With 28 models covering a temperature range from  $-120^{\circ}$  to  $+350^{\circ}\text{C}$ , including two space-saving refrigerating models that measure only 8 inches across, there's bound to be a Lauda circulator that fits your needs—and your laboratory—perfectly.

Lauda circulators offer many advanced features for accurate, safe operation. Digital models have convenient temperature setting and a bright, easy-to-read LED display. All Lauda circulators are constructed of durable stainless steel and are protected by highly sophisticated safety features such as variable over-temperature control, which automatically cuts off power in case of overheating or low liquid level.



Accuracy to  $0.01^{\circ}\text{C}$  is assured by a supersensitive platinum temperature sensor coupled with proportionally integrated differential (PID) control. Lauda eliminates electrical interference with other instruments through zero crossover switching/RFI suppression. Energy-efficient refrigeration systems reduce energy consumption on low-temperature models by as much as 75%. And a  $10\text{ mV}/^{\circ}\text{C}$  analog output is supplied with several units.

### Programmable Control

A built-in microprocessor-based programmer is available in heating and refrigerating models. This lets you program a series of temperature and time segments suited to your heating or cooling requirements.

For versatility in temperature control, Lauda technology gives you a choice of temperature ranges, features, and bath sizes that can't be matched. Whatever your requirements, there's a place for a Lauda circulator in your laboratory.

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

**Lauda**

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

# FALCON<sup>®</sup> TOOLS OF DISCOVERY

## Graduate With Us!

FALCON<sup>®</sup> Plastic Serological Pipets are made to measure up to the same standards you demand of yourself... test after test. To do that, they must graduate at the top of their class.

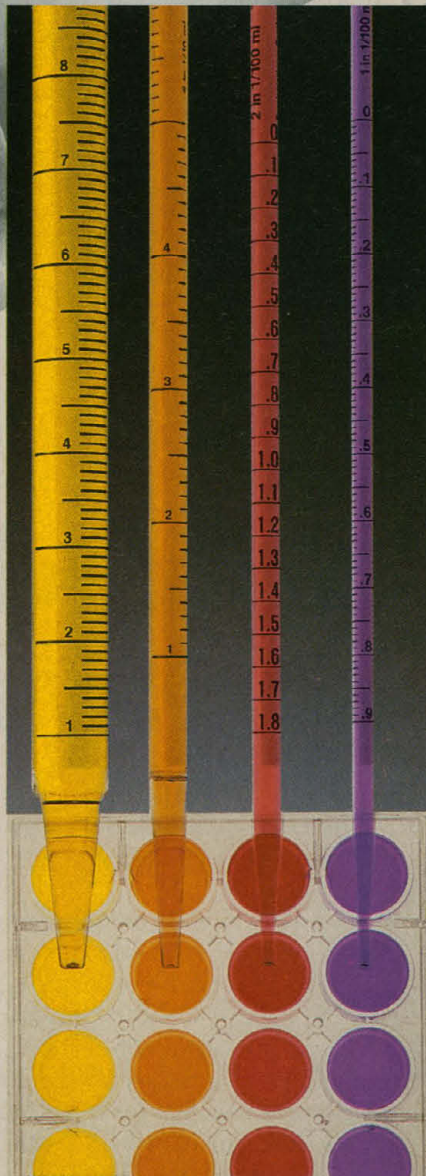
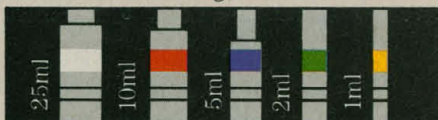
Nothing is taken for granted. The materials are crystal grade polystyrene for sharp clarity. And, our workmanship is reflected in every aspect of the graduations.

*Accuracy.* To meet ASTM\* guidelines you can graduate with plus or minus 3% accuracy. At Falcon, we insist on accuracy of plus or minus 0.75% for total delivery.

*Reverse graduations.* Something that lets you read a FALCON pipet, except the 1ml, either up or down so you can see at a glance the volume filled and the volume available.

*Negative graduations.* The graduations are extended slightly beyond the stated capacity to provide added capacity when needed.

*Color coding.* A bold color



code band around the pipet top facilitates easy identification without close scrutiny.

*Readability.* Finally, FALCON Pipets are clearly and legibly marked, so they are easily read.

FALCON Plastic Serological Pipets. We're so sure they are the top of their class, that we want to give you a "graduation" surprise... to convince you to graduate with us! To get it, simply send in the coupon below.

SEND ME MY NO-OBLIGATION GRADUATION GIFT OFFER!

It gives me one of the following: a Free Case of FALCON Pipets; a Prestige lab bench gift; or a 10% Rebate on my next FALCON Pipet order.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

INSTITUTION \_\_\_\_\_

DEPARTMENT \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TEL # ( ) \_\_\_\_\_

Limited time offer only. May be withdrawn at any time.

\*The American Society for Testing and Materials.

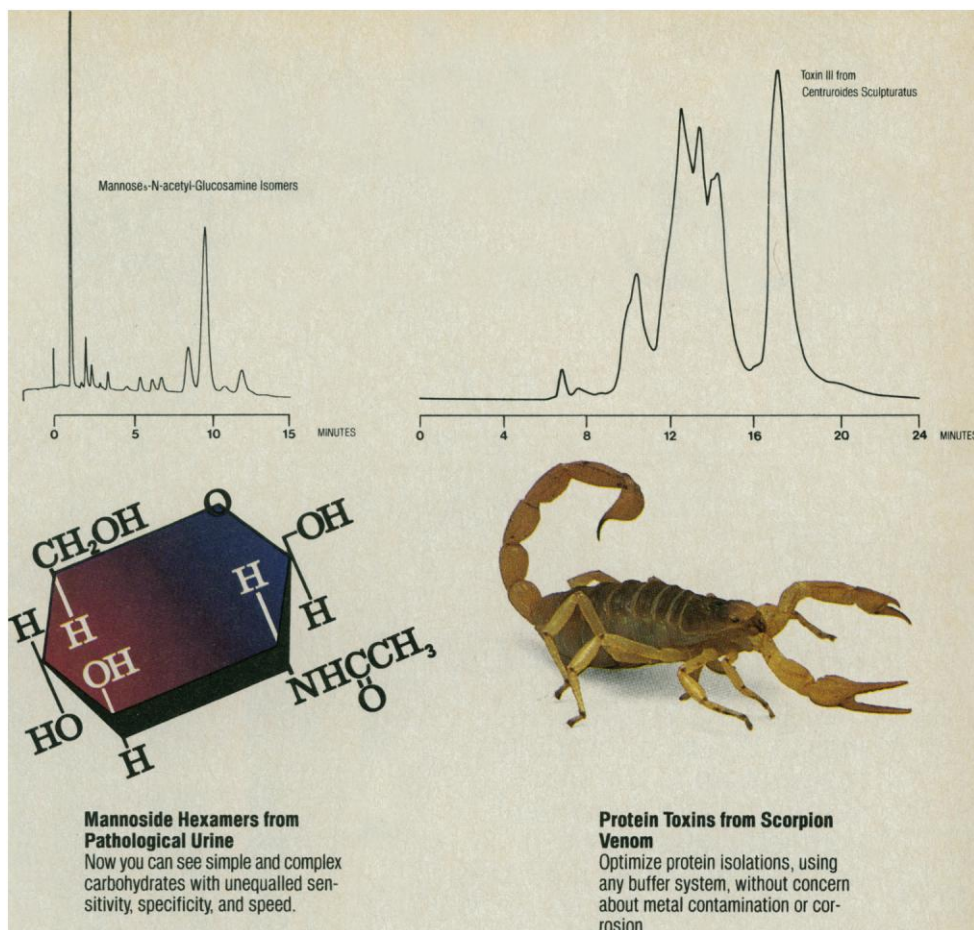


Falcon Labware<sup>®</sup>

Becton Dickinson Labware  
2 Bridgewater Lane,  
Lincoln Park, New Jersey 07035

**BECTON  
DICKINSON**





# Introducing the Four new ways to look at

Some say biochemistry is an art as much as a science. Because it requires the vision to look at things in new ways.



See us at FASEB, Booth No. 428

The Dionex BioLC Series gives you four new ways to look at biomolecules.

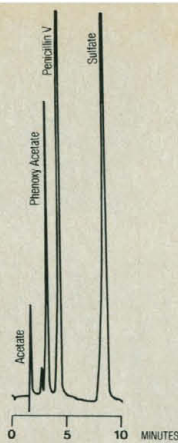
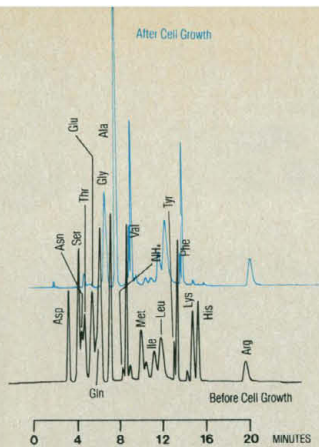
A breakthrough in carbohydrate analysis. No other technique can match the BioLC for sensitivity, specificity, and speed. High-specificity pulsed electrochemical detection lets you see endogenous or glycoprotein-derived carbohydrates with sensitivity equal to radio-labelling and 100 times greater than refractive index. Unique high-speed pellicular anion exchange resins easily sepa-

Circle No. 104 on Readers' Service Card

rate carbohydrate epimers, isomers, and complex oligosaccharides with better selectivity than gas chromatography.

Worry-free protein and peptide isolations. BioLC components are completely metal free. So you can select the column and buffer that provide the best separation and maintain biological activity—without concern for metal contamination or corrosion. The BioLC System is perfect for analytical and semi-preparative FPLC®-type separations and has the high

FPLC is a registered trademark of Pharmacia, Inc.



**Cell Culture Medium**  
Look at amino acids in complex matrices with minimal sample preparation.



**Penicillin V: Organic and Inorganic Anions**  
Determine a wide range of organic and inorganic anions in antibiotics and other biological samples using revolutionary conductivity detection technology.

# Dionex BioLC™ Series. biomolecular separations.

performance you need for any HPLC application.

Fast and reliable compositional amino acid analysis. Dionex BioLC gives you the speed and sensitivity of PITC methods with superior reproducibility and specificity—even for complex samples. This performance has been made possible by high-specificity anion and cation exchange separation and post-column derivatization. And when sample amounts are limited, BioLC Systems give you the ver-

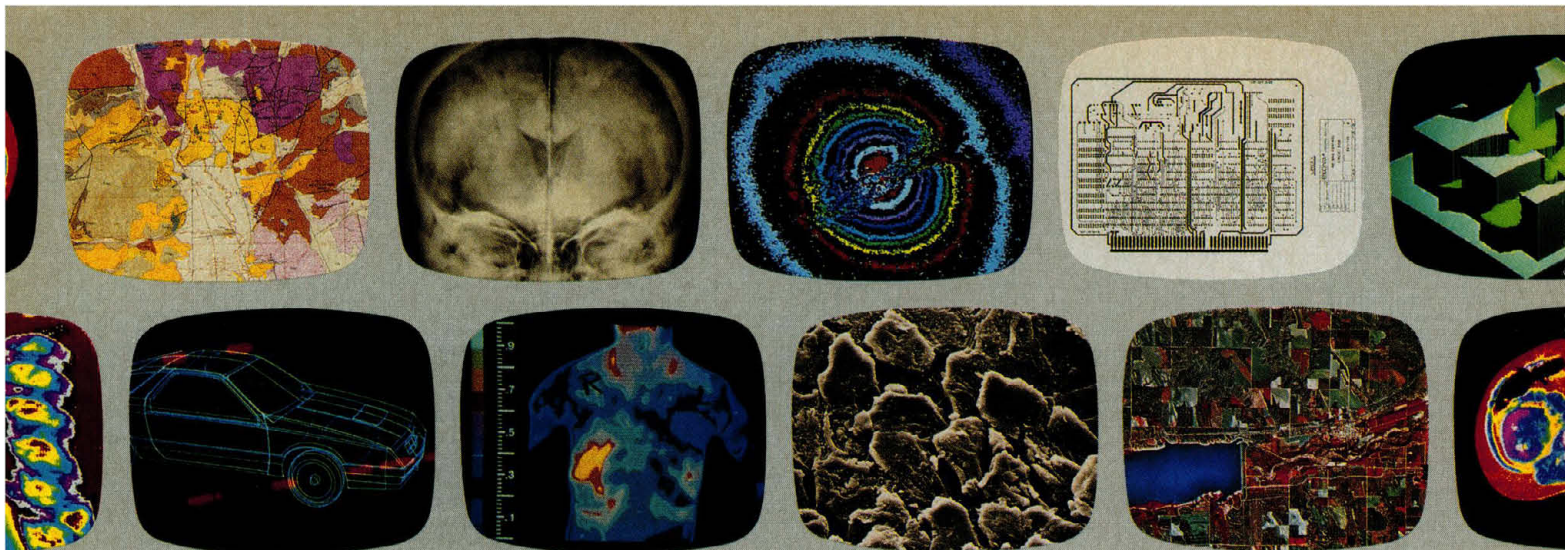
satility to perform reversed phase separation of prederivatized amino acids.

Even non-chromophoric ions. Dionex is the world leader in separation and detection of non-chromophoric ions. This expertise now lets you look at biologically important ions in ways you may not have thought possible. With the Bio-Ion™ System, organic acids, inorganic ions, metals, surfactants, TFA, and antibiotics can be determined easily, with high speed and sensitivity.

Our BioLC technical support staff is ready to help with your biomolecular separations. Call or write for a free brochure. Or talk to your Dionex Sales Representative to see BioLC in action. Dionex Corporation, P.O. Box 3603, Sunnyvale, CA 94088-3603 (408) 737-0700.



**DIONEX**  
A BETTER SOLUTION

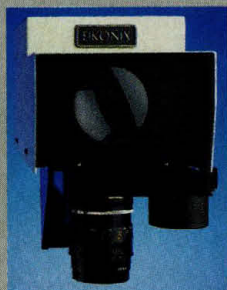


# Imagine what you could do if your computer could see.

Eikonix® high performance digital imaging cameras give your computer the ability to see. Which in turn gives you the ability to improve the quality of your research, and open new markets.

Easy-to-use Eikonix cameras are compatible with IEEE 488, DEC Q-Bus, Unibus and Multibus based systems as well as IBM® PCs. They're the most flexible, cost-

Eikonix high performance digital imaging cameras convert stationary pictures and objects into digital form via a linear sensor array. They offer precise analytical capabilities and highly accurate storage and retrieval for more applications than you can imagine.

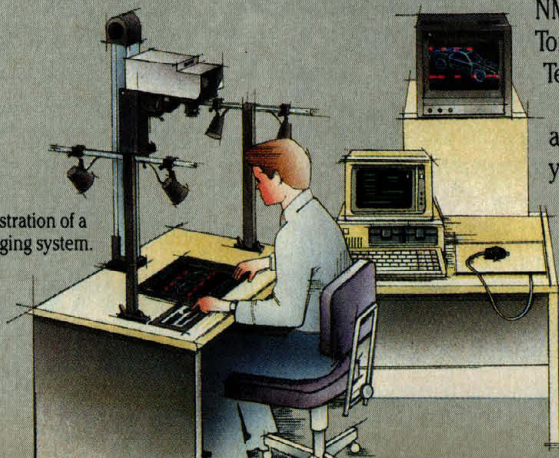


effective, reliable, and accurate means available for getting high resolution image data into a computer for analysis, manipulation, display and storage. And they're backed by a team of specialists that provides all the technical support you need for whatever applications you have – worldwide.

Typical applications: Artificial Intelligence ◻ Pattern Recognition ◻ Remote Sensing ◻ Earth Resource Analysis ◻ Color Infrared Imaging ◻ Electron Microscopy ◻ Astrophysics ◻ CAD input ◻ Modeling (2D & 3D) ◻ Circuit Design ◻ Mapping: Radar, Cartographic, Thematic, Utility, Topographic ◻ Medical Imaging: NMR, X-Ray, Ultrasound, PET, Autoradiography, Tomography ◻ Materials Testing: Surface Analysis, Tensilemetry.

If you'd like us to focus on your particular application, please call us at (617) 275-5070. If you'd like some literature, simply write to us at Eikonix Corporation, 23 Crosby Drive, Bedford, MA 01730, Telex: 951231.

Illustration of a typical imaging system.



**EIKONIX®**  
A KODAK COMPANY

Circle No. 171 on Readers' Service Card

No mess, no fuss,  
no kidding...  
Efficient blot transfers—  
guaranteed!



- No cooling required.
- Standard power supply.
- One hour—start to finish.

- Up to six transfers at one time.
- Minimal buffer—200 mL.
- One year—no quibble guarantee.

Save yourself a bunch of time and money—Order now. The Janssen SemiDry Electroblotter is guaranteed. Call 1-800-624-0137

 **JANSSEN**  
LIFE SCIENCES PRODUCTS

40 Kingsbridge Road  
Piscataway, NJ 08854

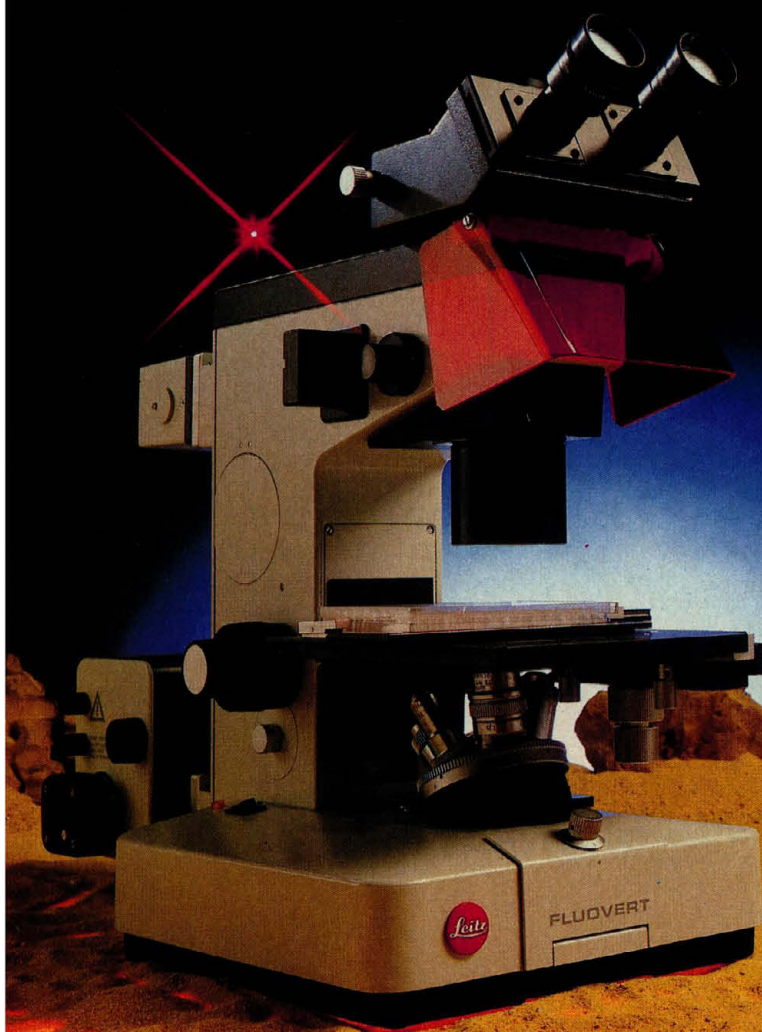
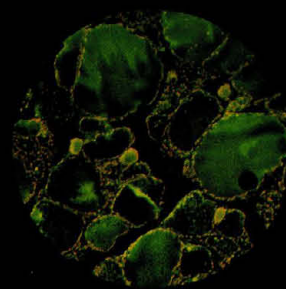
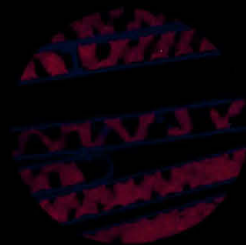
**JANSSEN**  
*pioneering in Life Sciences technology*

# One step beyond . . .

Leitz® broke the mold for conventional inverted microscope design with the introduction of the Fluovert and Labovert microscopes. They represent a giant leap forward in the evolution of the perfect inverted microscope.

Using the exclusive Reinheimer principle the Labovert and Fluovert microscopes bring the time proven advantages of the upright microscope to inverted microscopy.

See for yourself why Leitz is the natural selection for your next inverted microscope. For additional information or demonstration call or write E. Leitz, Inc., Rockleigh, NJ 07647. (201) 767-1100.



**INNOVATION**

Circle No. 98 on Readers' Service Card

R 3329

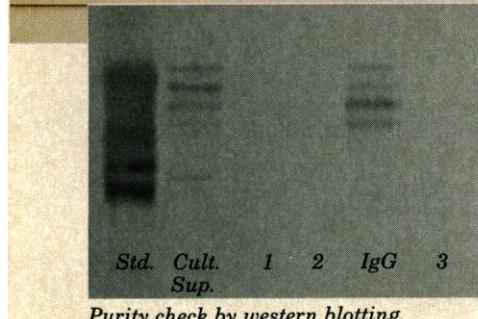
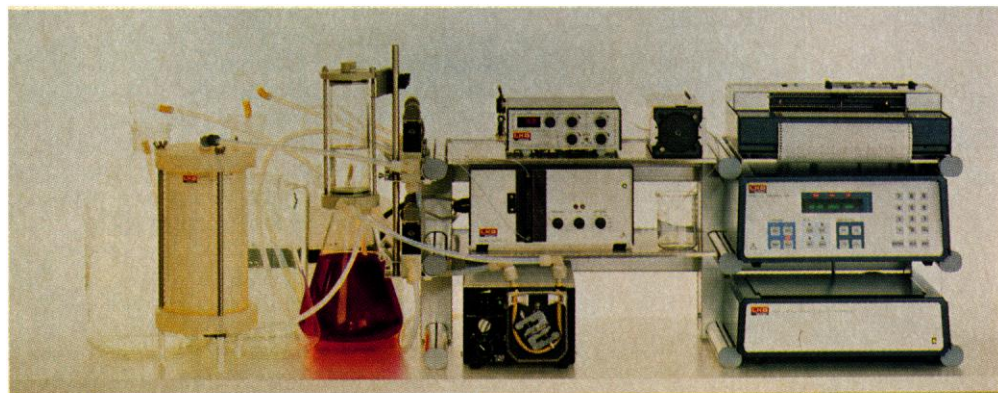
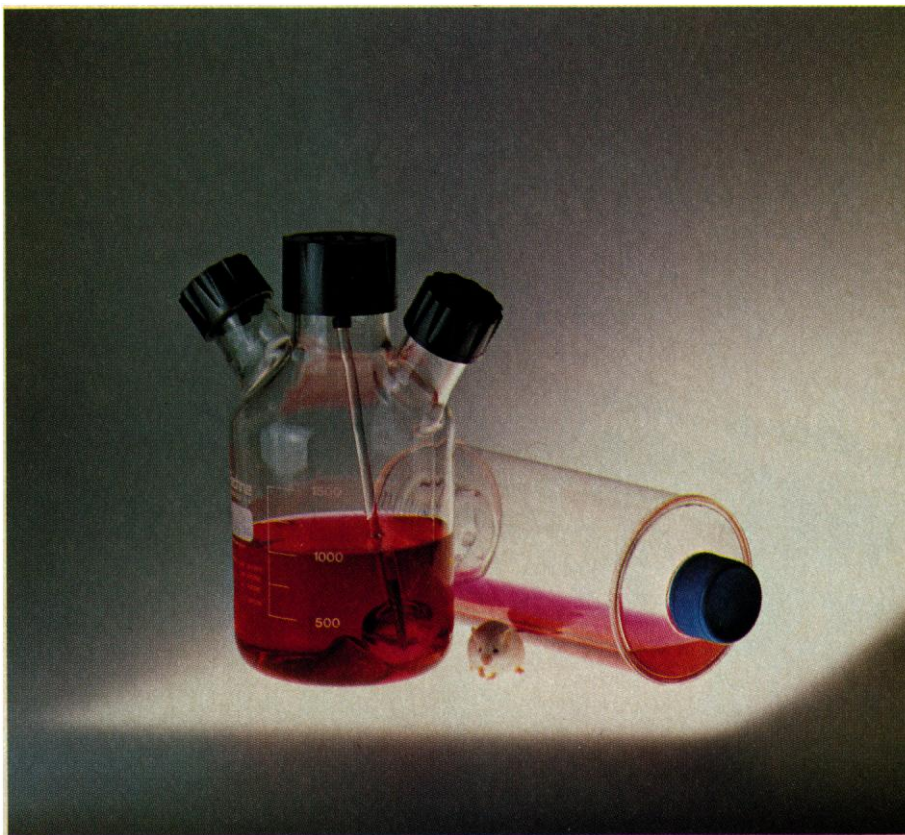
# MAB trapping

When your business is to purify MABs efficiently, it pays to use the best trap.

Pioneering new frontiers in biopurification demands new strategies. One key approach involves a preparative system designed to enable rapid methods development and scale-up of MAB purification. Based on LKB's Pilot Chromatography System, it exploits the advantages of mass ion exchange inherent in ZetaPrep discs and cartridges. A universal concentrating technique, mass ion exchange effectively achieves 50% to 90% purity of most monoclonals.

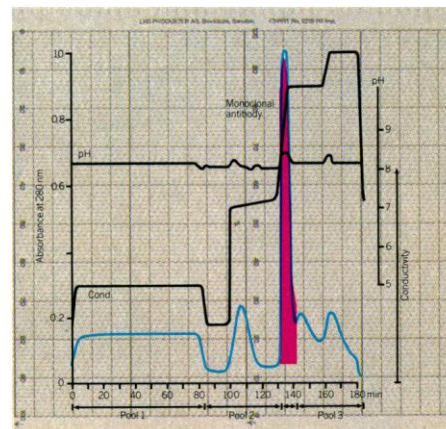
ZetaPrep discs can be used to determine optimal separation conditions quickly and accurately. Replace the disc with the appropriate ZetaPrep cartridge and you're ready for full-scale operation. Need higher purity? The Pilot Chromatography System is easily extended to the GTi Bioseparation System for high resolution HPLC and FPLC.

Don't become trapped in a strategic maze. Linear scale-up is just around the corner. Your local LKB representative can elaborate.



Purity check by western blotting.

Pilot Chromatography System.



Scale-up purification of IgG antihuman urokinase using a QAE ZetaPrep 800 cartridge. Yield: 1300 mg IgG. Flow rate: 160 ml/min. Sample volume: 10,000 ml cell culture supernatant.



Chromatography Division

LKB-Produkter AB, Box 305, S-16126 Bromma, Sweden. Tel. 08-7998000, telex 10492  
 Antwerp (03) 218 93 35 • Athens-Middle East + 30(1) 894 73 96 • Beijing 89 06 21 • Copenhagen (01) 29 50 44 • HongKong (852) 5-814 84 21  
 London (01) 657 88 22 • Lucerne (041) 57 44 57 • Madras (044) 45 28 74 • Moscow (095) 255-6984 • Munich (089) 85 830 • Paris (01) 64 46 36 36  
 Rome (06) 39 90 33 • Sao Paulo (011) 578 41 38 • Stockholm (08) 764 75 50 • Tokyo (03) 293-5141 • Turku (021) 678 111 • Vienna + 43 (222) 92 16 07  
 Washington (301) 963 3200 • Zoetermeer (079) 319201 Over 60 qualified representatives throughout the world.

Circle No. 64 on Readers' Service Card

# Vmax™ introduces kinetics to ELISA.

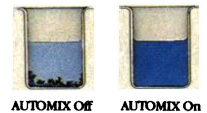


## Two systems in one.

The new Vmax Kinetic Microplate Reader reads all 96 wells in as few as 5 seconds. The result: a new level of throughput in endpoint analysis; and the ability to accurately monitor the initial linear portion of enzyme reactions for kinetic measurements.

## More than a matter of speed.

Vmax meets the stringent instrumentation requirements of solid-phase enzyme kinetics. For excellent precision in ELISA, the unique AUTOMIX function mixes the contents of each well between readings. Because enzyme reactions are temperature-dependent, Vmax has an isothermal reading chamber. Furthermore, onboard microprocessors compute reaction rates automatically.



## Expand your microassay capabilities.

Enzyme kinetics extends the usable dynamic range of ELISA on any microplate: from very low level enzyme activities to highly chromogenic samples. With Vmax, there is less need for multiple dilutions. Different assays can be performed on the same microplate.

For computational and data management requirements, the optional SOFTmax™ is a comprehensive, yet easy-to-use software package designed for IBM® and many IBM®-compatible microcomputers. SOFTmax also controls Vmax, providing yet another level of convenience and versatility.

## Introduce Vmax to your lab.

Whether you want to improve throughput of your endpoint analysis, or explore the new capabilities of solid-phase and liquid-phase enzyme kinetics in 96-well plates, contact Molecular Devices. Send for a copy of our new Application Note, *Kinetic Analysis for ELISA Using the Vmax*. We will also tell you about the special free trial program.



Molecular Devices Corporation  
3180 Porter Drive  
Palo Alto, CA 94304  
(415) 493-0166  
(800) 635-5577  
(800) 635-5588 (within California)

*Vmax* and *SOFTmax* are trademarks of Molecular Devices Corporation. IBM is a registered trademark of International Business Machines Corporation.

Circle No. 94 on Readers' Service Card

# Some hard facts about a major advance in fast affinity separations.

## Rigid new polymer lets you scale-up from mg to kg.

Bio-Rad's Affi-Prep™ product line marks the beginning of a new era in fast affinity chromatography. Based on an extraordinarily rigid macroporous polymeric bead, these products offer unsurpassed performance.

- **High flow rates** for both HPLC and production scale purifications
- **High stability** for long life and consistent results
- **High capacity** for maximum sample throughput

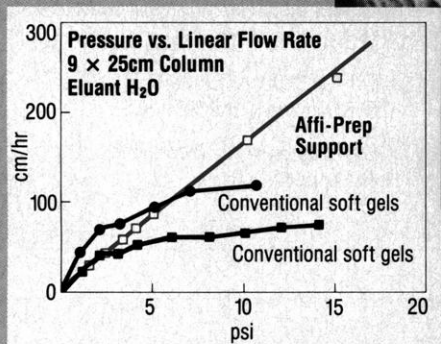
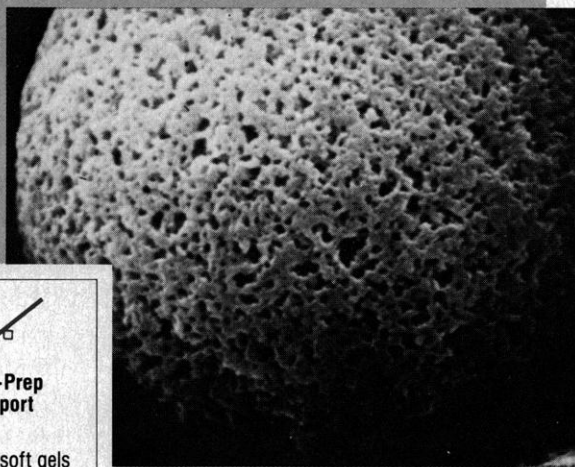
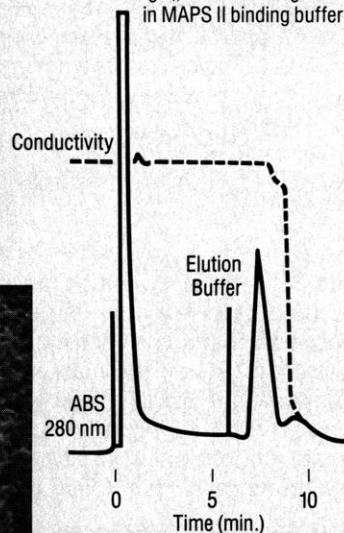
These materials are available both in pre-packed columns for HPLC and in bulk for large scale applications. Our new Bio-Rex® MP glass columns are recommended for scale-up applications.

**Some more hard facts about Affi-Prep supports:** Exceptionally high flow rates; pore size 1,000Å; pressure range 0–1,000 psi (0–70 bar); pH range 1–12.

For some more hard facts about the strongest affinity chromatography supports ever developed, contact your local Bio-Rad representative.

### Affi-Prep Protein A Separation

**Instrument:** Bio-Rad's MAPS® system  
**Column:** Affi-Prep Protein A, 4.6×30 mm  
**Sample:** Mouse ascites MOPC-21 IgG, 0.2 ml at 5 mg/ml in MAPS II binding buffer



**BIO-RAD**

**Chemical  
Division**

1414 Harbour Way South  
Richmond, CA 94804  
(415) 232-7000  
800-843-1412

Also in Rockville Centre, NY; Hornsby, Australia; Vienna, Austria; Mississauga, Canada; Watford, England; Munich, Germany; Milan, Italy; Tokyo, Japan; Utrecht, The Netherlands; and Glattbrugg, Switzerland.

See us at FASEB Booth #918

**It's the Chemistry that Counts.**



# CURRENT CONTENTS SUBSCRIBERS DO IT BEST!

*Current Contents . . . one of the most valuable short-cuts I have ever used!*

*CC provides our staff with a veritable gold mine of information.*

*I have subscribed to CC\* for over 12 years, and I believe it is the best current awareness system in existence.*

*Current Contents is still the best way for the cost-conscious to keep up with relevant information.*

*It's an outstanding publication . . .*

When it comes to talking about *Current Contents*\*, our subscribers do it best. They tell us that *CC*'s coverage, comprehensiveness, and reasonable cost make it the best current awareness tool on the market. The idea behind *Current Contents*, the world's most widely-used literature alerting service, is a simple one. Each week, *CC*'s seven separate editions allow you to locate articles of interest by scanning more than 6,500 journals and 2,600

multi-authored books. And articles are indexed by subject area, journal, and author for fast and easy reference searches. *CC* is the most comprehensive, least complicated way to keep up with new developments in major disciplines.

So what do *you* say? Isn't it time you subscribed to *Current Contents*?

\*Quotes are excerpted from testimonials by *Current Contents* subscribers.

Please send me more information about *Current Contents*®. I am interested in the following edition(s):

CC®/Life Sciences

CC/Clinical Medicine

CC/Agriculture, Biology & Environmental Sciences

CC/Physical, Chemical & Earth Sciences

CC/Social & Behavioral Sciences

CC/Engineering, Technology & Applied Sciences

CC/Arts & Humanities

I'm ready to subscribe now. Please send me an order form.

Name/Title

Organization/Department

Address

City

State/Province

Country

Zip/Postal Code

Telephone

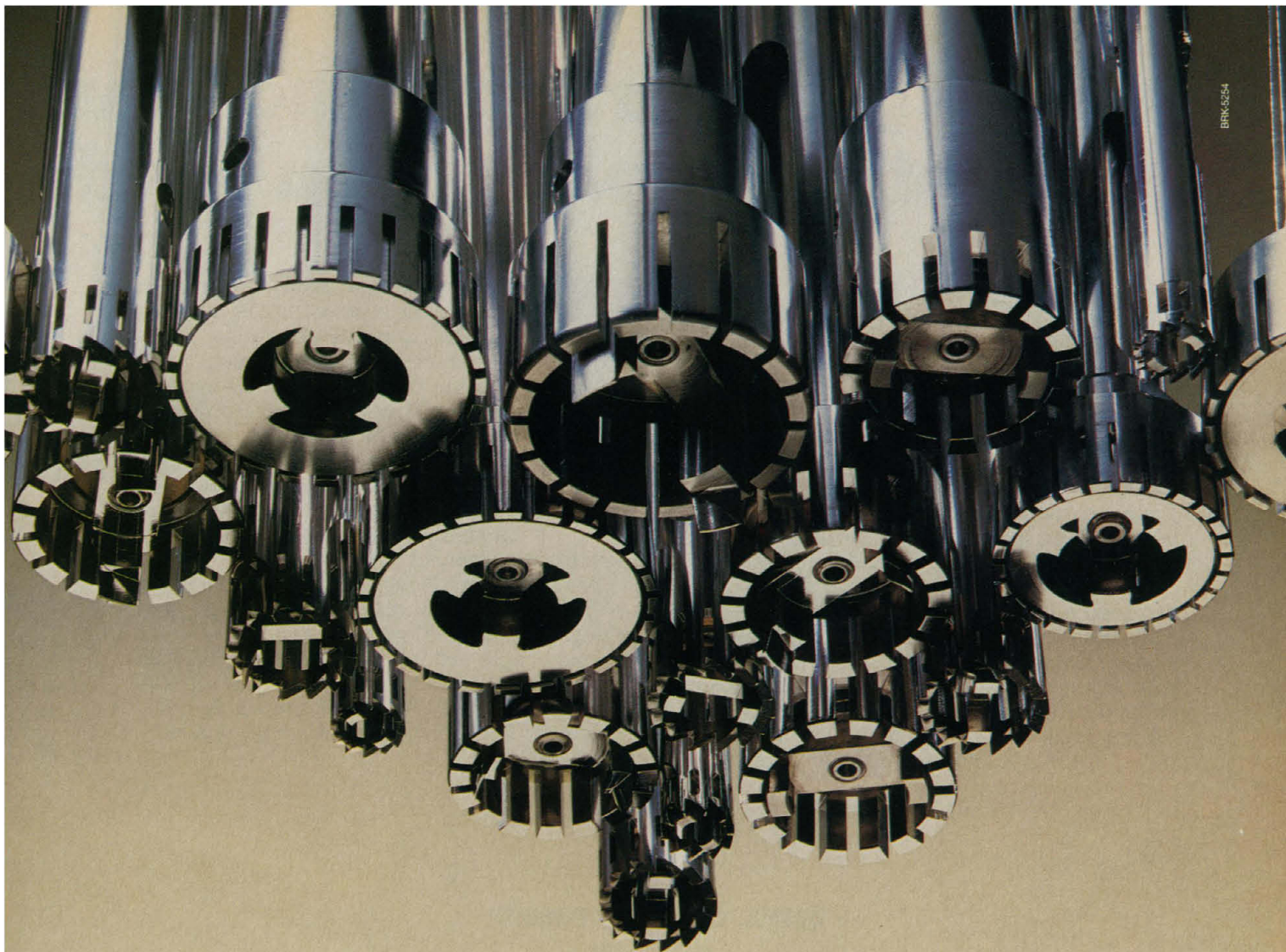
**isi** Institute for Scientific Information®

©1987 29-4676

Customer Services Dept., 3501 Market St., Philadelphia, PA 19104 U.S.A., Tel: (800) 523-1850, ext. 1405. In Pennsylvania: (215) 386-0100, ext. 1405. Cable: SCINFO. Telex: 84-5305. Telecopier: (215) 386-6362.

European Branch: 132 High St., Uxbridge, Middlesex UB8 1 DP, United Kingdom, Tel: 44-895-70016. Telex: 933693 UKISI

BRK-5254



# Only the sample breaks down.

Brinkmann homogenizers make the difference  
—in 30 seconds.

**Rapid action preserves biological integrity.**

Brinkmann homogenizers take advantage of mechanical shearing and cavitation to assure you of uniform sample breakdown in only 30 to 60 seconds. This rapid action protects your samples from inactivation by heat generated during prolonged homogenization.



**Powerful, durable motors work harder...longer.**

Brinkmann homogenizers use heavy-duty, high-speed 700 W and 1600 W motors for high torque and long life. They reach speeds of up to 27,000 rpm to disintegrate samples efficiently and effortlessly.

**One system meets all your homogenization needs.**

Brinkmann homogenizers handle samples from 0.5 mL to 25 L with 21 generators, two motors, and a complete range of accessories.

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



For information circle reader service number 45.  
For a demonstration circle reader service number 46

BRK-5455

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

# Keep lab glassware spic and span ...plus get the capacity you need

*"It's never any fun when you have to wash the dishes. Especially not in this lab where they do stuff like heating up fudge sauce in the Erlenmeyers and burn proteins in the beakers."*

Good news for folks like this: NAPCO laboratory glassware washers and dryers.

NAPCO understands that keeping glassware clean is a serious business in a working lab. You can't put up with such variables as contaminated culture dishes. So we started with the basics and designed a laboratory strength dishwasher.

It's built around a patented moving jet spray system, separate pre-wash, wash and rinse plumbing systems to prevent cross-contamination and microprocessor controls for precise selection of temperatures and cycle times. All is operated from a moisture tight,



sealed one-piece tactile-touch switch panel with a smooth, easy-to-clean surface. Surround everything with a corrosion stopping stainless steel housing that's easy to keep spotless and you have the glassware washer every laboratory needs.

Unless they need more capacity. Then NAPCO has that, too, with single, two, four and six-basket models to match any laboratory's volume requirement.

And, the complement to the washers is the NAPCO laboratory glassware dryer to keep things moving and productivity high.

Learn more about it by asking your NAPCO laboratory distributor representative or call 800-547-2555 (In OR 503-692-4686). NAPCO Scientific Company, P.O. Box 1000, Tualatin, OR 97062.

## NAPCO<sup>®</sup>

Research quality results  
...every time



**Shown above: Model NLD-400**  
Four-basket capacity electrically heated dryer; programmable time cycles

**Model NLW-200** Two-basket capacity washer in a compact space; door opens vertically; steam or electrically heated models

**Model NLW-400** Four-basket capacity washer; steam heated or electrically heated models

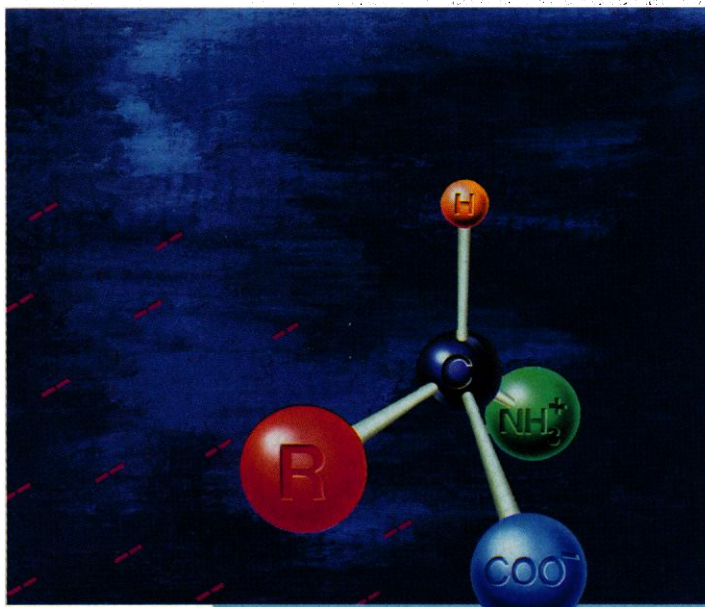
**Also available** Undercounter, single basket and six-basket washers, plus two and six-basket dryers

©1986 NAPCO Scientific

Circle No. 1 on Readers' Service Card

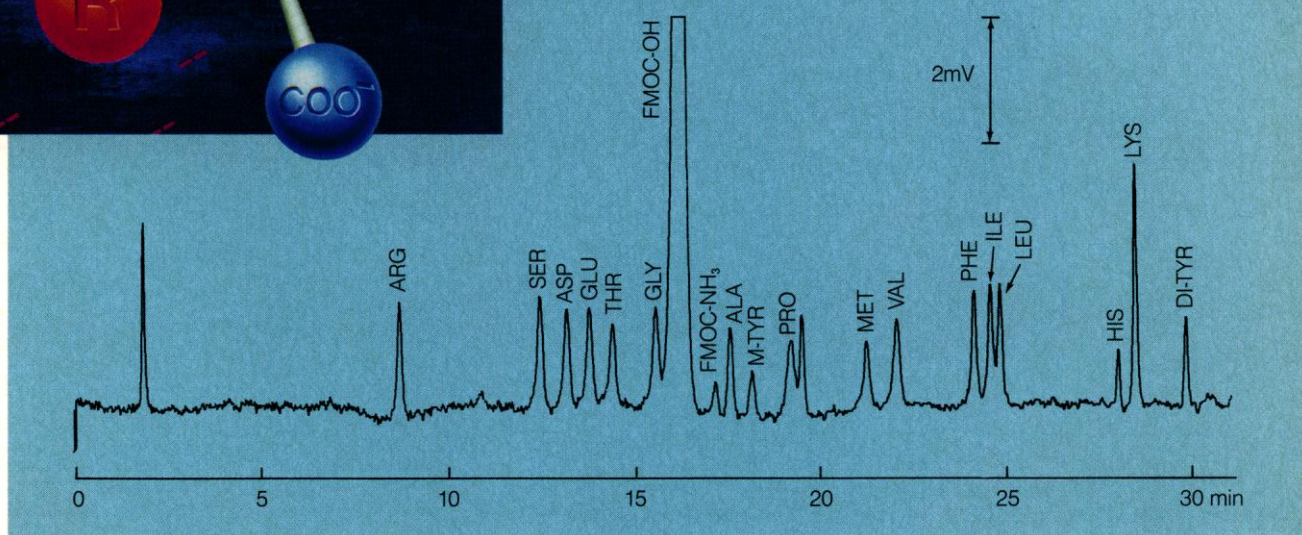
Varian Life Science announces the AminoTag™ Analyzer...

# How To Automate High Sensitivity Precolumn Amino Acid Derivatization



- The Model 9090 Microbot LC AutoSampler™ performs micro-derivatization and extraction which reduces laborious and imprecise manual sample preparation.
- Primary and secondary amino acids in a single run using AminoTag precolumn chemistry.
- Protein hydrolysate separation in *half* the time of classical systems.
- Unsurpassed sensitivity, far more sensitive than classical methods and . . .

\*AminoTag is Varian's trademarked name for FMOC, a fluorescent reagent.

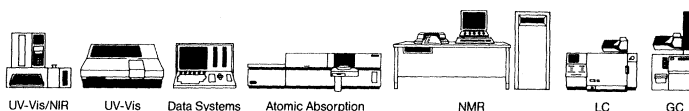


High sensitivity (400 femtomole) AminoTag chromatogram on a protein hydrolysate standard.

## Varian's full support package

- Installation
- Extended Service Warranty
- Certified Analysis Plan

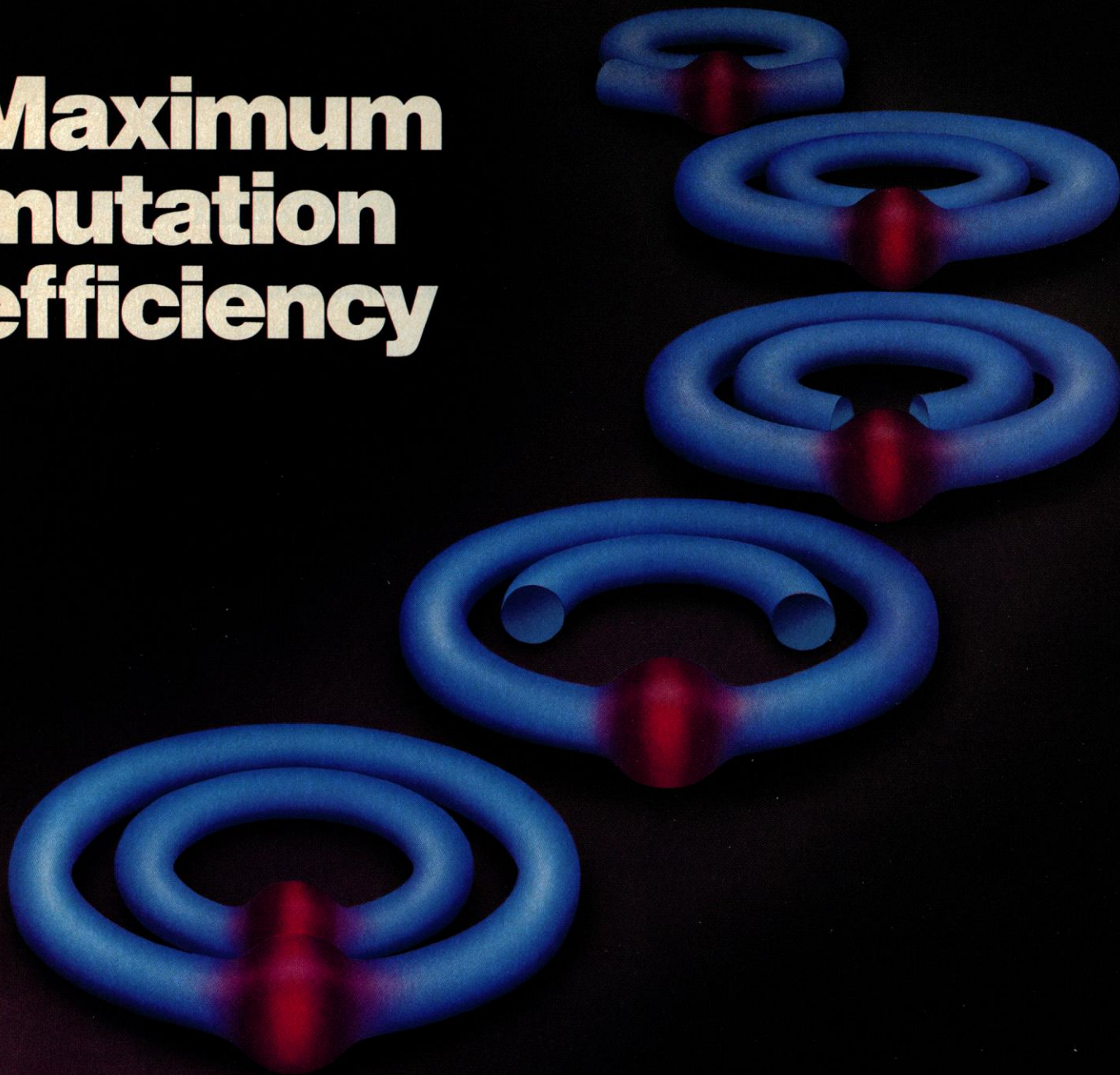
For immediate assistance, call 800-231-5772.  
In Canada, call 416-457-4130.



INTELLIGENT SOLUTIONS FOR YOU



# Maximum mutation efficiency



## The superior *in vitro* mutagenesis system from Amersham

The new Amersham *in vitro* mutagenesis system provides 80-95% efficiency—unlike most other oligonucleotide-directed systems which typically yield a high proportion of non-mutant clones. Mutants can be isolated and verified in one step, so large scale screening is eliminated.

**Convenient:** Specialized vector and host cells are not required. Includes a full set of reagents for ten reactions. **Flexible:** Repeat mutagenesis can be performed without subcloning, and selection of the mutant strand is independent of the nature of the cloned insert. **Reliable:** Like all Amersham products, this system has been rigorously tested to ensure high performance. For complete information, write or call Amersham toll-free. *For research use only*

Amersham Corporation  
2636 South Clearbrook Drive, Arlington Heights, IL 60005  
(312) 364-7100/(800) 323-9750 • Technical assistance: (312) 593-7973/(800) 341-7543

# Amersham

Amersham Canada Limited 505 Iroquois Shore Road, Oakville, ONT L6H 2R3 (416) 842-2720  
Toll Free: (800) 387-4060 (Ont/Quebec)/(800) 268-5061 (rest of Canada)

# New from Cambridge University Press

## The Quantum Universe

A.J. Hey and P. Walters

The first popular book to give a pictorial account of how physicists describe the fascinating world of subatomic particles. Illustrated by many superb color and black-and-white photographs, the text explains the subtle ideas of quantum mechanics in a very simple, nonmathematical, and down-to-earth style.

1987	192 pp.	26744-7	Cloth \$47.50 Cloth £27.50	31845-9	Paper \$16.95 Paper £ 9.95
------	---------	---------	-------------------------------	---------	-------------------------------

Now in paperback...

## Seven Clues to the Origin of Life A Scientific Detective Story

A.G. Cairns-Smith

This amusing, lively book explains in language comprehensive to the layman, the author's somewhat controversial views about the possible origin of life. "... it makes a splendid story ... Cairns-Smith has argued his case before in the technical scientific literature; here he sets it out in a way from which anyone — even those whose chemistry and biology stopped at 16 — can learn."

— *New Statesman*

1987	143 pp.	33793-3	Paper \$8.95 Paper £4.95
------	---------	---------	-----------------------------

## Leslie Peltier's Guide to the Stars

Leslie Peltier

Illustrated and written to introduce beginning stargazers to the excitement of visual astronomy, this book teaches the reader about the night sky and what one can observe simply by using binoculars. Complete with star charts, helpful sketches, and maps of the sky.

Co-published with Astro-Media Inc.

1987	208 pp.	33595-7	Paper \$11.95 Paper £6.95
------	---------	---------	------------------------------

## Chemicals and Society

### A Guide to the New Chemical Age

Hugh Crone

*Chemicals and Society* provides a sound scientific understanding of the facts and issues behind the growing use and misuse of chemicals in our society. It presents an accessible account of their benefits and risks, whether they are used as drugs, food additives, herbicides, or simply enter the environment as by-products of an industrial society.

1986	256 pp.	30869-0	Cloth \$39.50 £25.00	31359-7	Paper \$14.95 Paper £ 8.95
------	---------	---------	-------------------------	---------	-------------------------------

## Machines in Motion

Leonard Maunder

This book illustrates how the challenges of creating useful motion have been met by mankind, how man invents and designs machines, and how in turn this improves our understanding of nature. The author explores the contribution of machines in the progress of civilization, and the ways in which the natural phenomena of the physical world have been channelled through invention and design to useful purposes.

1987	192 pp.	30034-7	Cloth \$22.95 Cloth £12.95
------	---------	---------	-------------------------------

## Superstring Theory

### Volume 1: Introduction

### Volume 2: Loop Amplitudes, Anomalies and Phenomenology

Michael B. Green, John H. Schwarz, and Edward Witten

Cambridge Monographs on Mathematical Physics

This two-volume work is a systematic exposition of superstring theory and its applications, presenting many of the new mathematical tools that theoretical physicists are likely to need in coming years.

Volume 1: 1987	350 pp.	32384-3	Cloth: \$39.50 Cloth: £32.50
Volume 2: 1987	400 pp.	32999-X	Cloth: \$49.50 Cloth: £37.50

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, 800-227-0247, NY State only.

MasterCard and Visa accepted.

Circle No. 110 on Readers' Service Card

**The International Association for Scientific Computing (IASC) brings together the power of the CD-ROM and the needs of the biotechnology community in a new bi-annual publication -- CD\Biotech™.**



This is the world's premier optical disk-based journal and Magazine™ for the biotechnology community. A unique conferencing system allows users to comment on products, projects, software, articles, or just communicate on any topic -- without the pressure, awkwardness, and expense of online services. All IASC disks utilize the same user interface. Once acquainted with our friendly conferencing software, users will be able to access any of our disks effortlessly.

**CD\Biotech is your resource for reasonably-priced databases and software. CD\Biotech puts libraries of information at your fingertips. Some of the many items on this disk include:**

- The latest release of GenBank (the NIH-sponsored Genetic Sequences Databank) in both condensed and complete formats.
- The National Biomedical Research Foundation's Protein Identification Resource (both complete and condensed formats).
- Compiled programs and source-code in many areas of interest to scientists including: mathematical and statistical routines, spectroscopy, nuclear magnetic resonance, sequence analysis, quantum chemistry, fast fourier transforms, database, educational, "C" tutorials, graphics, CAD packages, DOS utilities/extensions, spoolers, programmers toolkits, screen utilities, deprotection utilities, scientific word-processors, etc. Languages including Lisp, expert shells, ADA Prolog, assemblers, FORTH and BASIC.

In all, there are more than 550 complete, fully operational programs are contained in this first issue. Each issue will present new, timely software and databases of interest to researchers and educators.

**Participate in this unique biotechnology database/computing collaboration. We've issued a call for papers on topics of concern to the biotechnology community -- write for our instructions to authors.**

If you're a researcher with special/general application software for the biotechnology community, let us market your software worldwide through the "shareware" marketing system or through free listings.

Free 10-line company/consultant/user-group listings in our Compact yellow pages. Or take out a larger paid advertising (by the page or the catalog) at unparalleled rates.

IASC has sophisticated compact disk mastering and simulation equipment. If you would like put your own databases on CD, our CD specialists will work with you to attain the highest quality product with the highest confidentiality.

A full-year subscription to CD\Biotech (comprising at least 2 issues on compact disk) costs only \$495. The disks are compatible with all available compact-disk readers. For more information, write: **IASC, 1040E East Duane, Sunnyvale, California, 94086, USA.**

Circle No. 193 on Readers' Service Card

# 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. 117 on Readers' Service Card

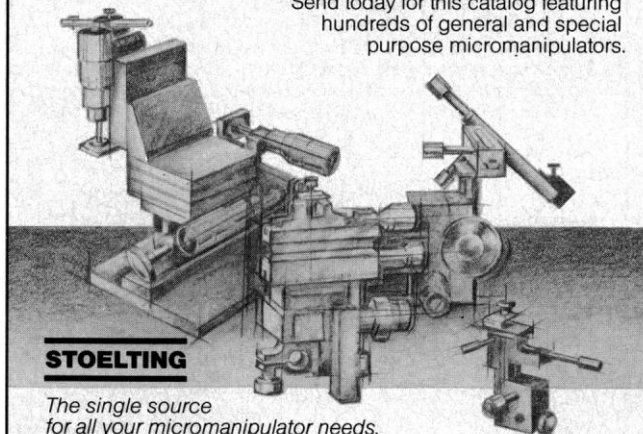
# Micromanipulators, Microscope Stages and Precision Laboratory Tools

Manual, DC or stepper motor micromanipulators and microscope stages

Custom-made precision slides and positioners

**Micromanipulators and bases in-stock  
for immediate delivery**

Send today for this catalog featuring  
hundreds of general and special  
purpose micromanipulators.



**STOELTING**

The single source  
for all your micromanipulator needs.



**Stoelting Co.**

1350 S. Kostner Ave. Chicago, Illinois 60623

**312 522-4500**

Circle No. 132 on Readers' Service Card

*If only  
someone  
would  
provide...*

- A fast and easy way to size DNA
- Ready to use, worry free Northern & Southern hybridization buffers.

## 5 Prime → 3 Prime Inc. does...

### SPUN COLUMNS TO SIZE DNA

- Remove free linkers and small DNAs with rapid 6 minute procedure. Especially useful during cDNA synthesis.
- RNase, DNase Free: Pre-packed, Pre-swollen centrifugal columns to size DNA.
- Three types available with exclusion limits 194 bp, 603 bp and 1353 bp.

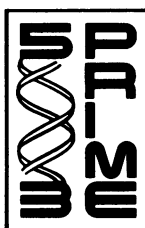
### HYBRIDIZATION BUFFERS

- RNase, DNase Free: Pre-tested pre-hybridization and hybridization buffers.
- Optimized worry free simplicity.
- Conveniently packaged 2X buffers for easy addition of formamide or dextran sulfate.

## ...And More

- All at affordable prices designed to make your research easier.

**Call or write for a complete list of  
5 PRIME → 3 PRIME product offerings for  
molecular biology research.**



**5 Prime → 3 Prime, Inc.**

19 E. Central Avenue

Paoli, PA 19301

Call Collect (215) 644-4710

# DRUGS OF THE FUTURE

Yours may be?  
You are an independent  
investigator.

You have discovered a new  
biological or chemical compound.

We are a Swiss financial  
institution and have the know-how  
and the means to develop your  
compound into a new drug.

Please send preliminary  
information to:

**DEBIOPHARM S.A.**  
**Rue du Petit-Chêne 38**  
**1003 LAUSANNE, SWITZERLAND**

Circle No. 20 on Readers' Service Card

See them, try them  
**FASEB**  
**Booth 1353**



## Temperature Microprobes

**Accurate to 0.1°C**

**Flexible probes, .009" dia.**  
(fits inside 23ga hypodermic needle)

**Needle probes, .013" dia. (29ga)**

**Response as fast as .005 seconds**

These quality sensors with guaranteed accuracy can be used with any type "T" thermocouple readout. We also make larger probes for clinical and laboratory use and, if you have an unusual application, we can quote on custom sensors in any quantity. Call or write for free brochure on our probes and digital thermometers.

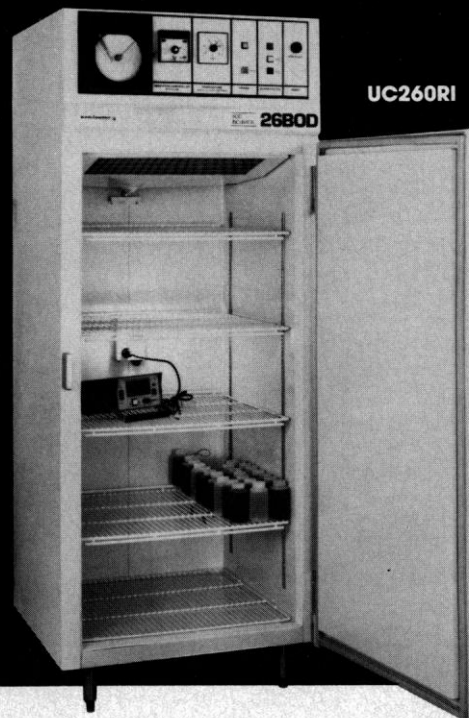
we fit into your plans  
**sensortek**

154 HURON AVENUE, CLIFTON NJ 07013, USA Tel: 201-779-5577

Circle No. 7 on Readers' Service Card

# It's YOUR Choice!

Designed for either controlled pull-down  
or warm-up applications



**Kelvinator Scientific's new refrigerated  
incubator gives you...**

- 26 cu. ft. of capacity
- Wide operating range... -15°C to +50°C
- Precise temperature control within 1° accuracy
- Control panel with illuminated touch controls and automatic alarm system with audio and visual signal
- 5/8" LED digital temperature readout
- Optional 7-day recorder with 6" chart and inkless stylus

For complete details and specifications on Kelvinator Scientific's new incubator or their complete line of over 50 laboratory refrigerators and freezers write for free literature or call —

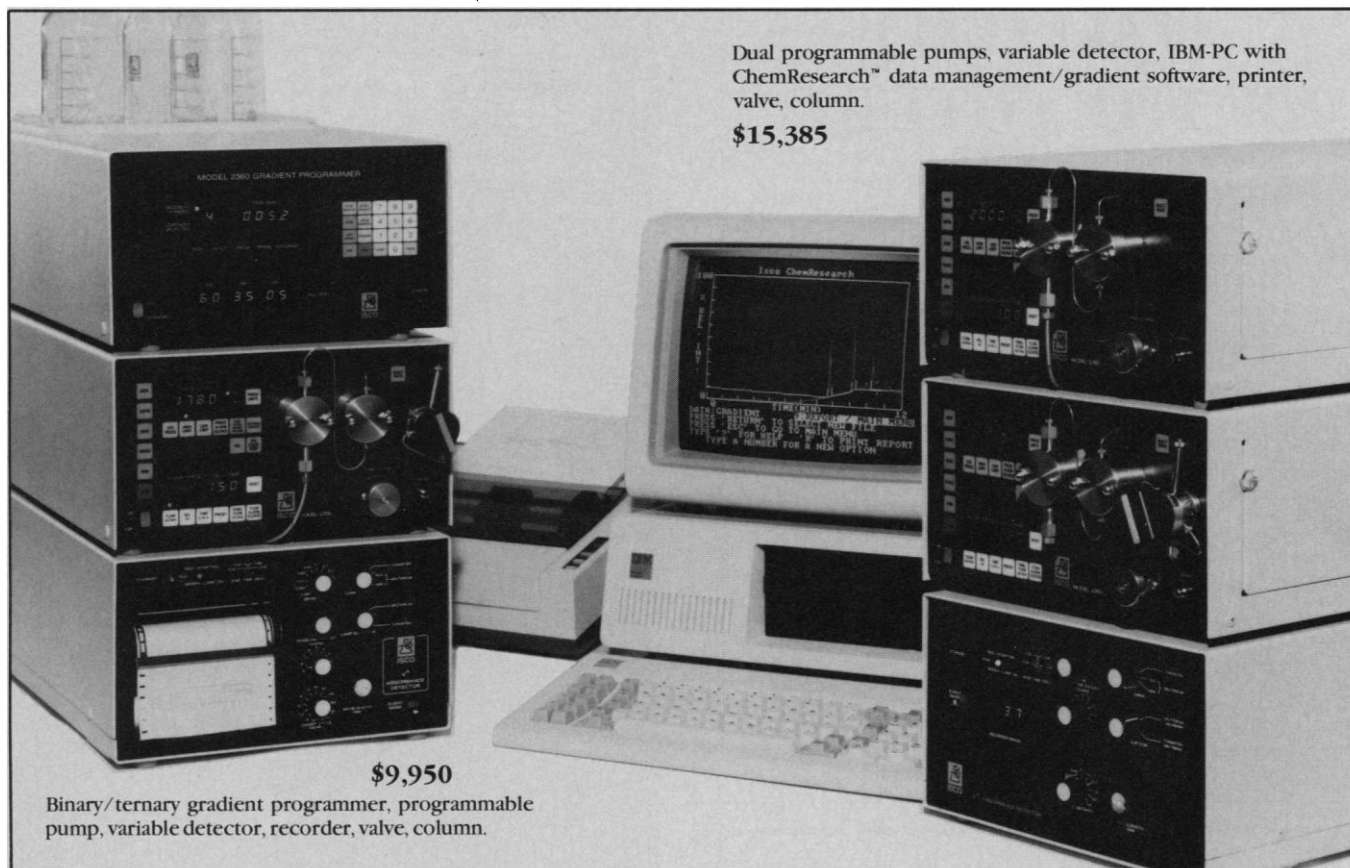
**1-800-558-7627 (in WI 414-682-8891)**  
**Telex: 910-260-3507**

**Kelvinator**   
SCIENTIFIC

621 Quay St., Manitowoc, WI 54220  
800-558-7627 (in WI 414-682-8891) Telex 910-260-3507 FAX# 414 682-0383  
*One of the White Consolidated Industries*

Circle No. 125 on Readers' Service Card





Dual programmable pumps, variable detector, IBM-PC with ChemResearch™ data management/gradient software, printer, valve, column.

\$15,385

\$9,950

Binary/ternary gradient programmer, programmable pump, variable detector, recorder, valve, column.

## The right chromatograph is going to cost you less.

Isco chromatographs offer top value. An Isco single-pump ternary or dual-pump binary gradient system complete with IBM-PC can give you greater performance and capability than the two top-selling systems that cost much more. You'll get great value with any Isco HPLC system: analytical, microbore, or prep; stainless or inert.

With top performance. An Isco system gives you a precision pump that can be programmed to change flow rate based on either time or volume delivered. A sensitive, stable 190-to-750 nm detector with flow cells down to 0.12  $\mu$ l. And a complete, powerful data management system that is actually easier to use than many simple integrators found in other chromatographs.

And top reliability. We've made over 50,000 detectors, pumps, and related instruments to earn our reputation for dependability. We back it up with the best warranty offered anywhere—three years, parts and labor.

Find out how much value Isco gives you by sending for a comparison of the leading HPLC systems. We'll also include our 80-page general catalog and 48-page HPLC catalog. Call toll free (800) 228-4250 (except NE, AK) or write: Isco, Inc., P.O. Box 5347, Lincoln, NE 68505.



# THE QUIET MICROCENTRIFUGE THAT'S WORTH SHOUTING ABOUT

In side by side comparisons against all of today's leading brands, this low cost microcentrifuge proved to be conspicuous in its silence. In fact, at a full 17,000 xg, Centra-M's noise level is barely perceptible, while others are noisy at much lower forces.

But quietness is only one of its virtues. You get versatility and large capacity—up to 42 microsamples per run—with a unique universal rotor which accepts all popular microtubes. You get the fastest acceleration/deceleration... less than 8 seconds up and 10 seconds down. Plus you get the features today's labs want most—auto-reset timer, momentary spin control, fail-safe cover interlock and maintenance-free brushless motor.

Before you buy a microcentrifuge, stop, look, and listen to the new Centra-M. Call or write for a demonstration today.



For a demonstration, circle No. 79

For literature, circle No. 80

## CENTRA-M<sup>®</sup> HIGH-SPEED MICROCENTRIFUGE

**IEC CENTRA<sup>®</sup> SERIES... Today's Leading Line of Bench-top Centrifuges.**



### CENTRA-8R High Performance Refrigerated Centrifuge

Here's *true* floor model centrifuge performance in a bench-top. Universal 4 x 750 ml rotor/adaptor system spins most tubes and bottles to over 2500 xg... 4 x 250 ml rotor generates over 3150 xg. Temperature control from 0°C to 39°C with unsurpassed accuracy.



### CENTRA-8 Large Capacity General- Purpose Centrifuge

This 3-liter system has the power and capacity to get big workloads done fast. Thirteen different rotor systems including an 8 x 240 ml rotor for over 5000 xg performance. Digital controls provide simple operation with outstanding accuracy.



### CENTRA-4B High Speed General- Purpose Centrifuge

Spins everything from standard tubes and 250 ml bottles at 2500 xg to microtubes at over 10,000 xg. Also accepts microplates, microhematocrit capillaries and microscope slides. Compact and quiet, the 4B is like six centrifuges in one.



### CENTRA-HN The Advanced "Workhorse" Centrifuge

Combines the durability and mechanical features of the popular Model HN-SII with the latest control and safety innovations. The 1-liter system features unique bar graph indicators for speed and run time. Large selection of rotors for clinical or industrial applications.



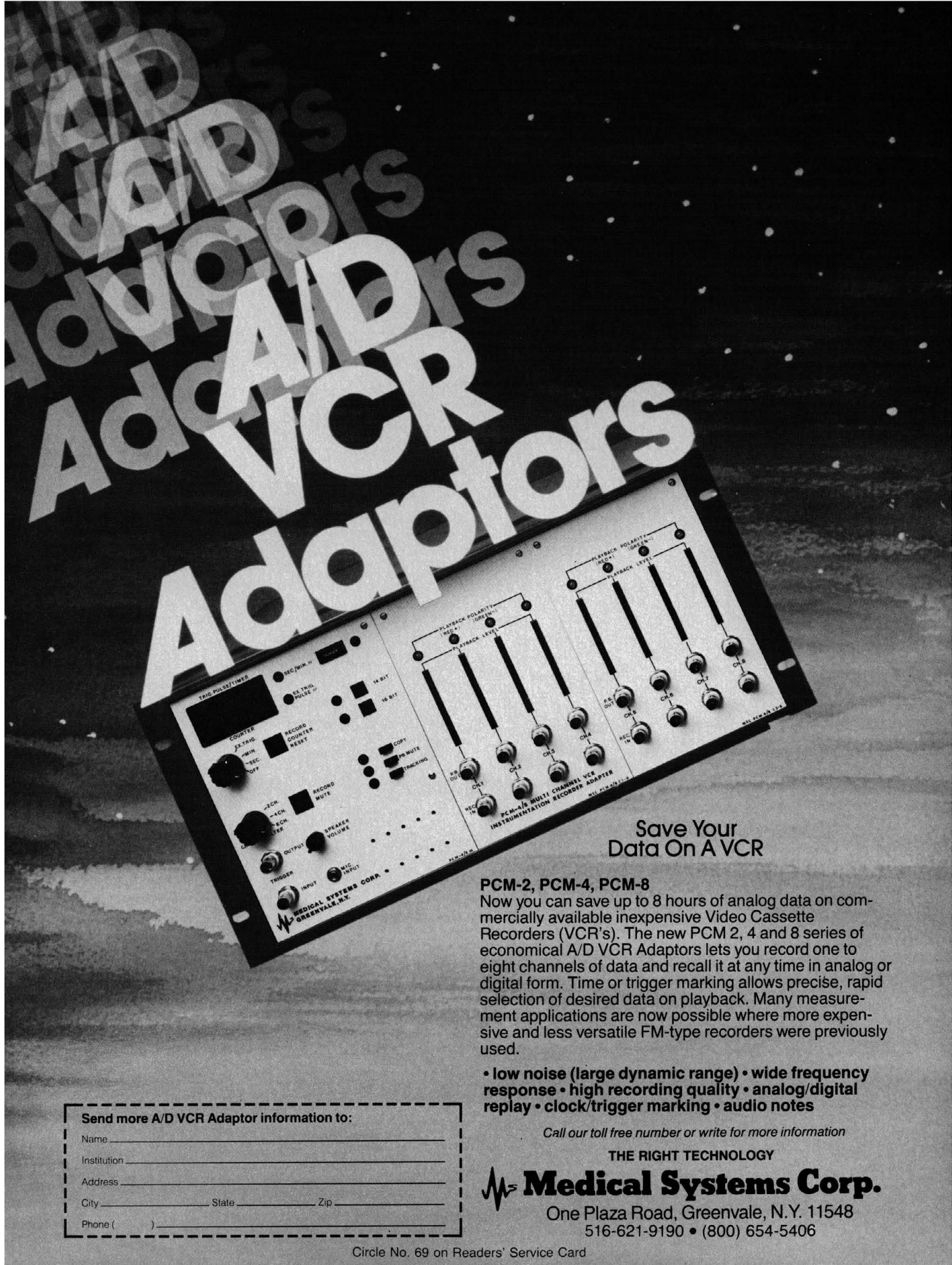
### CENTRA-W Automatic Cell Washer

This microprocessor-controlled unit flawlessly automates washing steps for antiglobulin testing, yet offers the flexibility to meet specific lab requirements. Rugged dual-angle rotor eliminates need to periodically inspect and replace a rotating bowl assembly.

300 Second Ave.  
Needham Hts., MA 02194  
(617) 449-0800



**INTERNATIONAL EQUIPMENT COMPANY**  
A DIVISION OF DAMON



### Save Your Data On A VCR

#### PCM-2, PCM-4, PCM-8

Now you can save up to 8 hours of analog data on commercially available inexpensive Video Cassette Recorders (VCR's). The new PCM 2, 4 and 8 series of economical A/D VCR Adaptors lets you record one to eight channels of data and recall it at any time in analog or digital form. Time or trigger marking allows precise, rapid selection of desired data on playback. Many measurement applications are now possible where more expensive and less versatile FM-type recorders were previously used.

- low noise (large dynamic range) • wide frequency response • high recording quality • analog/digital replay • clock/trigger marking • audio notes

Call our toll free number or write for more information

THE RIGHT TECHNOLOGY

## Medical Systems Corp.

One Plaza Road, Greenvale, N.Y. 11548  
516-621-9190 • (800) 654-5406

Send more A/D VCR Adaptor information to:

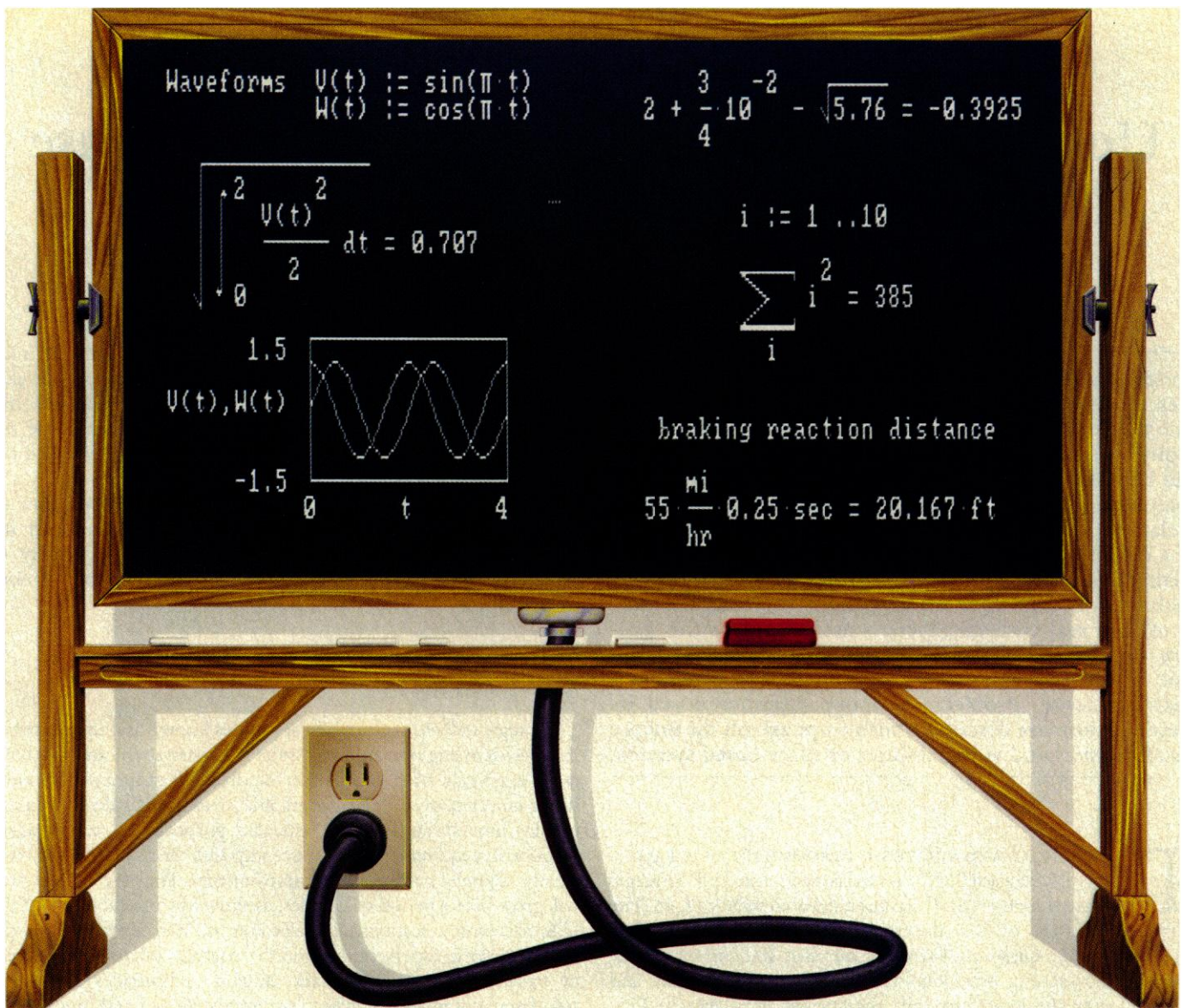
Name \_\_\_\_\_

Institution \_\_\_\_\_

Address \_\_\_\_\_

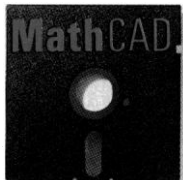
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone ( ) \_\_\_\_\_



## Engineering calculation raised to a new power.

The only software program to combine the flexibility of a blackboard, the simplicity of a calculator, and the power of a personal computer.



Now you can write calculations on your PC in standard math notation—mixing text, formulas and graphics with the same free-form ease you have on a blackboard or scratchpad.

**No new languages to learn.** Simply type equations anywhere on the screen and MathCAD automatically calculates and displays

your results as numbers or graphs—exactly as you want to see them. Change anything, and MathCAD instantly recalculates the results. Add text at any point to support your work. Then print and save your entire calculation as an integrated document.

**Powerful built-in functions.** MathCAD handles both real and complex numbers and does automatic unit conversion and dimensional analysis. It has a full range of built-in functions including integration, differentiation, fft's and cubic splines. Or you can define your own. No wonder thousands of engineers use MathCAD every day, for everything from robotics

to signal processing and thermodynamics to fluid mechanics.

**Call us today.**

We're convinced that MathCAD belongs on every engineer's desk. At \$249, with our no-risk, 30-day money-back guarantee, you really can't afford not to try it. To place your order or to request further information, call us now at:

**1-800-MathCAD**

(in Massachusetts: 617-577-1017)

MathCAD. Once you've tried it, you'll wonder what you ever did without it. Order today.

Requires IBM PC® or compatible, 512KB RAM, graphics card. IBM PC is a registered trademark of International Business Machines Corporation. MathCAD™ MathSoft, Inc.

Circle No. 73 on Readers' Service Card

# MathCAD

MathSoft, Inc., 1 Kendall Sq., Cambridge, MA 02139

# Information for Contributors

## THE EDITORS OF *SCIENCE*

Manuscripts should be addressed to the Editor, *Science*, 1333 H Street, NW, Washington, DC 20005. Submit three copies together with a letter of transmittal giving

- 1) the names and telephone numbers of the authors;
- 2) the title of the paper and a statement of its main point;
- 3) three to eight keywords to be used for indexing;
- 4) the names, addresses, telephone numbers, and fields of interest of four to six persons outside your institution who are qualified to referee the paper;
- 5) the names of colleagues who have reviewed the paper;
- 6) the total number of words (including text, references, and figure and table legends) in the manuscript; and
- 7) a statement that the material has not been published and is not under consideration for publication elsewhere.

In addition, include with your manuscript:

- (i) any paper of yours that is in press or under consideration elsewhere and includes information that would be helpful in evaluating the work submitted to *Science*;
- (ii) written permission from any author whose work is cited as a personal communication, unpublished work, or work in press but is not an author of your manuscript;
- (iii) for review of manuscripts based on crystallographic data, two copies of the coordinates.

Before being reviewed in depth, most papers are rated for their interest and overall suitability by a member of the Board of Reviewing Editors. Papers submitted in disciplines for which there is no appropriate member of the Board of Reviewing Editors may be screened by editorial staff members in consultation with outside experts. Papers that are not highly rated are returned to the authors within about 2 weeks; the title page and abstract from one copy are retained for our files. The others are reviewed in depth by two or more outside referees. Authors are notified of acceptance, rejection, or need for revision, usually within 6 to 10 weeks. Papers cannot be resubmitted, either after initial screening or after in-depth review.

## Conditions of Acceptance

When a paper is accepted for publication in *Science*, it is understood by the editors that (i) any materials necessary to verify the conclusions of the experiments reported will be made available to other investigators under appropriate conditions; (ii) all authors have seen and approved the final version of the manuscript; (iii) sequence and crystallographic data will be offered for deposit to the appropriate data bank; and (iv) a paper will not be released to the press or the public before its publication. If there is a need in exceptional cases to publicize data in advance of publication, the AAAS Office of Communications (202-326-6440) must be consulted.

## Selection of Manuscripts

In selecting papers for publication, the editors give preference to those of general significance that are well written, well organized, and intelligible to scientists in different disciplines. An attempt is made to balance the subject matter in all sections of *Science*. Membership in the AAAS is not a factor in selection.

Accepted papers are edited to improve the accuracy and effectiveness of communication and to bring them within the specified length limits. When the author's meaning is not clear, the editor may consult the author by telephone; when editing is extensive, the manuscript may be returned for approval and retyping before the type is set.

Categories of signed papers include: general articles, research articles, reports, letters, technical comments, book and software reviews, perspectives, and policy forums.

**General Articles.** General articles (up to 5000 words) are expected to (i) review new developments in one field that will be of interest to readers in other fields; (ii) describe a current research problem or a technique of interdisciplinary significance; or (iii) discuss some aspect of the history, logic, policy, or administration of science. Readers should be able to learn from a general article

what has been firmly established and what are unresolved questions; speculation should be kept to a minimum.

Many of the general articles are solicited by the editor, but unsolicited articles are welcome. Both solicited and unsolicited articles undergo review.

General articles should include a note giving the authors' names, titles, and addresses; a summary (50 to 100 words); an introduction that outlines for the general reader the main point of the article; and brief subheadings to indicate the main ideas. The reference list should not be exhaustive; a maximum of 50 references is suggested. Figures and tables should occupy no more than one printed page.

**Research Articles.** A research article (up to 4000 words) is expected to contain new data representing a major breakthrough in its field. The article should include an author note, abstract, introduction, and sections with brief sideheads. A maximum of 40 references is suggested. Figures and tables together should occupy no more than one printed page.

**Reports.** Reports (up to 2000 words) are expected to contain important research results. They should include an abstract (no more than 100 words) and an introductory paragraph. A maximum of 30 references is suggested. Figures and tables together with their legends should occupy no more than one printed page.

**Letters.** Letters are selected for their pertinence to material published in *Science* or because they discuss problems of general interest to scientists. Letters pertaining to material published in *Science* may correct errors; provide support or agreement; or offer different points of view, clarifications, or additional information. Personal remarks about another author are inappropriate. Letters may be reviewed by outside consultants. Letters selected for publication are intended to reflect the range of opinions received. The author of the *Science* paper in question is usually given an opportunity to reply.

All letters are acknowledged by postcard; authors are notified if their letters are to be published. Preference is given to letters that do not exceed 250 words. Letters accepted for publication are frequently edited and shortened in consultation with the author.

**Technical Comments.** Technical comments (up to 500 words) may criticize articles or reports published in *Science* within the previous 6 months or may offer useful additional information. Minor issues should be resolved by private correspondence. The authors of the original paper are asked for an opinion of the comment and are given an opportunity to reply in the same issue if the

comment is published. The comments, and sometimes the reply, are subject to the usual review procedures. Priority disputes undergo extensive review and are published only when action is recommended.

**Book and Software Reviews.** The selection of books and software packages to be reviewed and of reviewers is made by the editors. Instructions and length specifications accompany items to be reviewed when they are sent to reviewers.

## Manuscript Preparation

**Typing.** Use double-spacing throughout the text, tables, figure legends, and references and notes and leave margins of at least 2.5 centimeters. Put your name on each page and number the pages starting with the title page.

**Titles.** Titles should be short, specific, and amenable to indexing. For general articles the maximum length is 80 characters and spaces; for research articles and reports the maximum is 100 characters.

**Summaries or abstracts.** These should include a sentence or two explaining to the general reader why the research was undertaken and why the results should be viewed as important. The abstract should convey the main point of the paper and outline the results or conclusions.

**Text.** A brief introduction should indicate the broad significance of the paper. The whole text should be intelligible to readers in different disciplines. Technical terms should be defined. All tables and figures should be cited in the text in numerical order.

**Symbols and abbreviations.** Define all symbols, abbreviations, and acronyms.

**Units of measure.** Use metric units. If measurements were made in English units, give metric equivalents.

**References and notes.** Number references and notes in the order in which they are cited, first through the text and then through the table and figure legends. List a reference only one time. References that are *always* cited together may be grouped under

a single number. Use conventional abbreviations for well-known journals; provide complete titles for other journals. For references with up to five authors provide all the names; for more than five, provide the name of the first author only. See issues of the journal for examples.

**Unpublished observations.** Reference to unpublished data should be given a number in the text and placed, in correct sequence, in the references and notes.

**Acknowledgments.** Gather all acknowledgments into a brief statement at the end of the references and notes.

**Informed consent.** Investigations on human subjects must include a statement indicating that informed consent was obtained after the nature and possible consequences of the studies had been fully explained.

**Animal welfare.** Authors using experimental animals must state that their care was in accordance with institutional guidelines. For animals subjected to invasive procedures, the anesthetic, analgesic, and tranquilizing agents used, as well as the amounts and frequency of administration, must be stated.

**Figures.** For each figure submit three high-quality glossy prints or original drawings of sufficient size to permit relettering but not larger than 22 by 28 centimeters (8½ by 11 inches). On the back of every figure write the first author's name and the figure number and indicate the correct orientation. *Manuscripts with oversized figures will be returned to the author without review.* Photocopies of figures are not acceptable; transparencies, slides, or negatives cannot be used because they cannot be sent to reviewers.

On acceptance of a paper, authors requesting the use of color will be asked to supply slides or negatives of the color artwork and to pay \$600 for the first color figure and \$300 for each additional figure as a contribution toward printing costs.

Illustrations reprinted from other publications must be credited. It is the author's responsibility to obtain permission to reprint such illustrations in *Science*.

**Tables.** Tables should supplement, not duplicate, the text. They should be numbered consecutively with respect to their citation in the text. Each table should be typed, with its legend (double-spaced), on a separate sheet. Give each column a heading with units of measure indicated in parentheses. Do not change the unit of measure within a column.

**Equations and formulas.** Use quadruple-spacing around equations and formulas that are to be set off from the text. Define all symbols.

**Uncertainties and reproducibility.** Evidence that the results are reproducible and the conditions under which this reproducibility (replication) was obtained should be explicitly stated. The effect of limitations in experimental conditions on generalizability of results should be discussed. Uncertainties should be stated in terms of variation expected in independent repetitions of the experiments; they should include an allowance for possible systematic error arising from inadequacies in the assumed model and other known sources of possible bias. Probabilities from statistical tests of significance should be subordinated to the reporting of results and associated uncertainties.

## Printing and Publication

**Proofs and reprints.** One set of galley proofs is sent to the authors. An order blank for reprints accompanies the proofs.

**Scheduling.** Papers are scheduled for publication after *Science* has received corrected galley proofs from the authors. Papers with tables or figures that present problems in layout, or with color figures or cover pictures, or that exceed the length limits may be subject to delay.

## Cover Photographs

Particularly good photographs that pertain to a paper being submitted will be considered for use on the cover. Submit prints (not slides, negatives, or transparencies) with the manuscript.

# WE DON'T CUT CORNERS.

***Baker's radius-cornered one-piece interior maximizes personnel protection.***

Caution: inadequate containment of dangerous biological materials can be hazardous to your health.

The best way to reduce the risk? Baker Biological Safety Cabinets. With the best materials. The best workmanship. The best performance.

One-piece stainless steel and true metal rounded radiused corners make our interior work areas leak-tight and easy to clean. Other cabinets are *seamed* with metallic-colored caulking compound, which can shed, peel, and

allow harmful contaminants and bacteria to build up.

At The Baker Company, we never compromise on personnel or product protection. Should you?

Call toll free for complete data. Or write to The Baker Company, P.O. Drawer E, Sanford, ME 04073.

**1-800-992-2537**



Circle No. 6 on Readers' Service Card

## The Third Princeton-Liposome Conference\*

### THERAPEUTIC APPLICATIONS OF LIPOSOMES

MAY 11-13, 1987 • PRINCETON, NEW JERSEY • SCANTICON CONFERENCE CENTER

#### CONFERENCE CHAIRMEN:

Dr. Sol M. Gruner (Princeton University)

Dr. Marc J. Ostro (The Liposome Co., Inc.)

Dr. Gerald Weissmann (N.Y.U. Medical Center)

#### SYMPOSIA AND SPEAKERS

**SYMPOSIUM I: INFECTIOUS DISEASE** • Chairman: Dr. George Mackaness (Squibb Institute for Medical Research) —  
 Dr. Andrew Whelton (Johns Hopkins University) Dr. Richard S. Ginsberg (The Liposome Co., Inc.)  
 Dr. Gerald P. Bodey (M.D. Anderson Hospital & Tumor Institute) Dr. Gabriel Lopez-Berestein (M.D. Anderson Hospital & Tumor Institute)

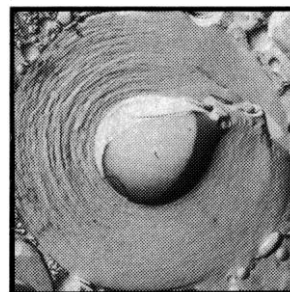
**SYMPOSIUM II: INFLAMMATION** • Chairman: Dr. Gerald Weissmann (N.Y.U. Medical Center) —  
 Dr. Bengt Samuelsson (Karolinska Institute, Sweden) Dr. John Dingle (Strangeways Research Laboratories, U.K.)  
 Dr. Kurt Isselbacher (Harvard Medical School) Dr. Alan L. Weiner (The Liposome Co., Inc.)

**SYMPOSIUM III: CANCER I** • Chairman: Dr. Dr. Alan C. Sartorelli (Yale University School of Medicine) —  
 Dr. Joseph Bertino (Yale University School of Medicine) Dr. Pieter Cullis (University of British Columbia)  
 Dr. Victor Ling (Ontario Cancer Institute, Canada) Dr. Roman Perez-Soler (M.D. Anderson Hospital & Tumor Institute)

**SYMPOSIUM IV: CANCER II** • Chairman: Dr. Rudolph L. Juliano (University of North Carolina, Chapel Hill) —  
 Dr. Emil Frei (Dana Farber Cancer Institute) Dr. Peter Dukor (Ciba-Geigy, Ltd., Switzerland)  
 Dr. Zanvil Cohn (Rockefeller University) Dr. John Weinstein (National Institute of Health)

**SYMPOSIUM V: VACCINES** • Chairman: Dr. Keith J. Dorrington (Connaught Laboratories, Canada) —  
 Dr. Richard Lerner (Scripps Clinic & Research Foundation) Dr. Carl R. Alving (Walter Reed Army Institute of Research)  
 Dr. Louis Chedid (Univ. of So. Florida College of Medicine) Dr. Howard Six (Baylor College of Medicine)

Senator Lowell Weicker from Connecticut will be the Special Guest Speaker on Monday, May 11 • 8 p.m. at the banquet.



\* CO-SPONSORED BY THE BIOLOGY DEPARTMENT OF PRINCETON UNIVERSITY AND THE LIPOSOME COMPANY, INC.

**Posters:** Scientists interested in presenting **POSTER PAPERS** should submit a brief (250 words or less) abstract with their registration forms.

**Payments:** Registration fee must accompany this registration form in order for a place to be reserved in your name.

	NON PROFIT	ALL OTHERS	Name _____	Title _____
<b>REGISTRATION</b>				
3 Day Conference (includes double room, board, banquets, concert and conference fees)	\$450	\$850	Dept. _____	Organization _____
3 Day Conference (includes single room, board, banquets, concert and conference fees)	\$600	\$1,000	Street _____	City _____
Daily Conference (conference fees, luncheons for 3 days, concert and banquet)	\$250	\$600	State _____	Country _____
			Zip _____	Telephone _____

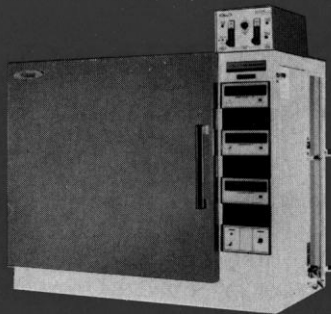
Return to: M. Babice, Conference Coordinator, The Third Princeton-Liposome Conference, P.O. Box 9301, Trenton, N.J. 08650-1301

Please check this box if you wish to purchase the book entitled "Liposomes, Biophysics to Therapeutics" being offered at a conference price of \$35 (reg. price - \$70).

Circle No. 119 on Readers' Service Card



CO<sub>2</sub> INCUBATORS 6.0 to 33 cu. ft. capacity. Solid state control and LED display of temperature, humidity and CO<sub>2</sub>. Features self-decontamination cycle. Walk-in, benchtop, floor models. Temperatures from ambient + 5°C to 60°C ± 0.1°, humidity from 70% to 96% ± 2% and CO<sub>2</sub> from 0% to 20% ± 0.1%. Multi-gas option available. Also, many other types of incubators.



## Hotpack CO<sub>2</sub> incubators with self-decontamination save time and effort

Independent lab test prove Hotpack CO<sub>2</sub> incubators' decontamination cycle achieves 7 log reduction in *B. Stearothermophilus* spores, as required for FDA sterilization standards. Decon cycle does it automatically between test runs. Get this exclusive Hotpack feature plus more. Call Hotpack today for your **FREE** literature packet.

Hotpack works...with you...direct. Custom systems? Modifications? We'll engineer to your needs. Call us toll free

# 800-523-3608

or 215-824-1700 in Pennsylvania

**Hotpack Corporation** 10940 Dutton Rd. Philadelphia, PA 19154 • Telex 685-1197

To have a Sales Representative call circle reader service number 123  
For literature circle reader service number 124

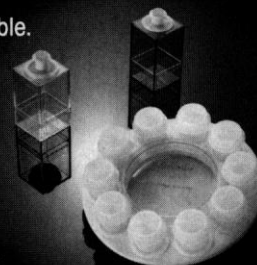
## The modern approach to dialysis with DiaCell™

Previous methods for small sample dialysis were tedious or expensive.

### THE DiaCell™ SYSTEM:

- No more tying knots or losing sample identity.
- Two DiaCell™ capsule sizes for samples: from 10-100 and 100-5000 microliters.
- Membranes are renewable for pennies each.
- Pre-cut membranes also available at 1/10 the cost of comparable membranes.
- Samples are readily accessible.

Complete ten-place system only \$145 + shipping.



Call before noon for next-day delivery.

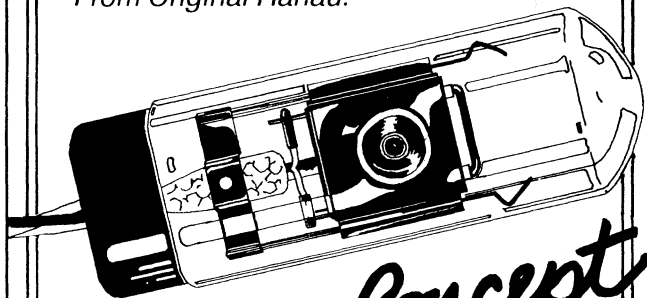
In MD call: (301) 775-2819 • Elsewhere: 1-800-247-5345

INSTRUMED P.O. BOX N • UNION BRIDGE, MD 21791

Circle No. 187 on Readers' Service Card

# HELLMA® D<sup>2</sup> LAMPS

From Original Hanau.



*The new Concept*

UV light sources for all major spectrophotometers and detectors.

Also inquire about our large variety of stock and custom cells.

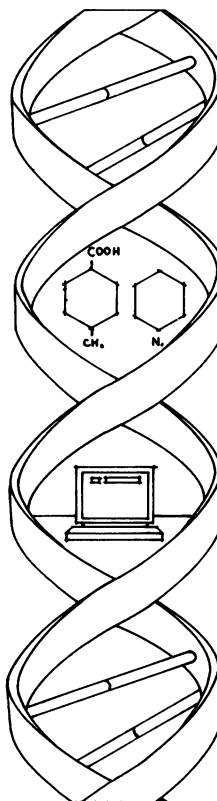
For over 20 years...

**HELLMA®** Quality you can trust.

Box 544, Borough Hall Station, Jamaica, N.Y. 11424  
Telephone (718) 544-9534 or (718) 544-9166.

Circle No. 41 on Readers' Service Card

## SOFTWARE FOR SCIENTISTS



### MOLGRAF

Many-featured molecular graphics package for the IBM PC and Apple II. Incorporates DIY to let you build your own molecule, plus LECTURE which displays a sequence of structures to illustrate a talk, etc. etc. **\$140**

### KINETIC, EBDA, LIGAND, LOWRY: Note - 2nd release.

The popular collection of radioligand binding analysis programs for the IBM PC. Supports IBM or Hercules graphics cards. **\$140**

Many more packages available from:

## Elsevier - BIOSOFT

Please send orders to Elsevier-BIOSOFT (JIC), 52 Vanderbilt Avenue New York, NY 10017

SEE US AT  
FASEB

Circle No. 111 on Readers' Service Card



**BRAND X**  
(Staph-derived Protein A)

**REPLIGEN**  
(rProtein A™)

**WHO SUPPLIES THE MOST IMMOBILIZED PROTEIN A ACTIVITY PER ML OR PER \$\$\$?**

Let's face it, Immobilized rProtein A™ is not an "inert" substance. Its value is directly related to its IgG binding activity. And immobilized recombinant Protein A from Repligen has more IgG binding activity per ml (> 20 mg human polyclonal IgG per ml) or per \$ (as low as \$.30/mg IgG binding capacity\*) than the other brands. Repligen's rProtein A is readily available in two forms: immobilized to crosslinked 4% agarose beads in milliliter and multiliter quantities or as an ultrapure lyophilized protein in laboratory and multigram quantities.

For more information, please call (617) 225-6000. Or write REPLIGEN Corp., One Kendall Square, Bldg. 700, Cambridge, Massachusetts, 02139 Attention Customer Service.

\*In bulk quantities

**RepliGen**

Circle No. 10 on Readers' Service Card

**TMC MICRO-g® LAB TABLES**

Higher performance...more options, more features

The new TMC Micro-g Series 63-500 lab tables with advanced Gimbal Piston® isolators achieve highest attenuation of both vertical and horizontal vibration. Features include new leveling feet, new 2" thick, high-stiffness, highly damped stainless steel top with rounded seamless edges and corners.

Options offer added utility and convenience: armrests, shelving, choice of top surfaces, casters, equipment support bars, Faraday cages. Sizes from 25" x 36" to 36" x 60". Write or call for new product bulletin No. MG30-86 and price list today.

**Technical Manufacturing Corporation**  
15 Centennial Drive • Peabody, MA 01960  
Telephone: 617-532-6330 • Telex: 951408

Micro-g® Series 63-500  
vibration isolation tables

TMC-25

Circle No. 95 on Readers' Service Card

# Try A New Approach to Life Sciences—Search STN International®!

Search STN International online to get effective answers to your life science questions. Stay current on new developments in fast-changing fields such as biotechnology, pharmaceuticals, forensic science, and immunology.

More than one-third of our CAS ONLINE® database contains life science information. Try BIOSIS Previews®, and our newest file, BIOCAS, the link between BIOSIS Previews and CAS ONLINE. All searchable with only one command language on STN!

Please fill out and clip this coupon today.

**YES: Please rush me my FREE STN information packet.**

Name \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

Mail to:

**STN International  
Marketing, Dept. 33886  
2540 Olentangy River Road  
P. O. Box 02228  
Columbus, Ohio 43202 USA**



Circle No. 19 on Readers' Service Card

"Meet MilliGen"  
Spring Symposium

## Advances in DNA and Peptide Synthesis

### Agenda

- Chemical synthesis of large DNA fragments
- Base composition assay for synthetic DNA
- Chemical synthesis of end-labelled and modified oligonucleotides
- Comparison of Boc/Fmoc chemistries for peptide synthesis
- Continuous flow peptide synthesis
- Peptides and DNA analysis and purification

### Speakers will include:

Dr. Gareth Priestley	(C.R.B.)
Dr. Paul Sheppard	(C.R.B.)
Dr. Eric Atherton	(C.R.B.)
Dr. Hubert Koester	(MilliGen)
Dr. Alex Bonner	(MilliGen)
Dr. Jack Johansen	(Millipore)

### Locations and Dates

Boston, MA	April 9
Saddlebrook, NJ	April 13
Washington, D.C.	April 16
Research Triangle, NC	April 20
Chicago, IL	April 24
Columbus, OH	April 28
Toronto, Canada	April 30
Montreal, Canada	May 4
Houston, TX	May 11
St. Louis, MO	May 26*

\*Coincides with Tenth American Peptide Symposium. Seminar from 1-4 p.m.

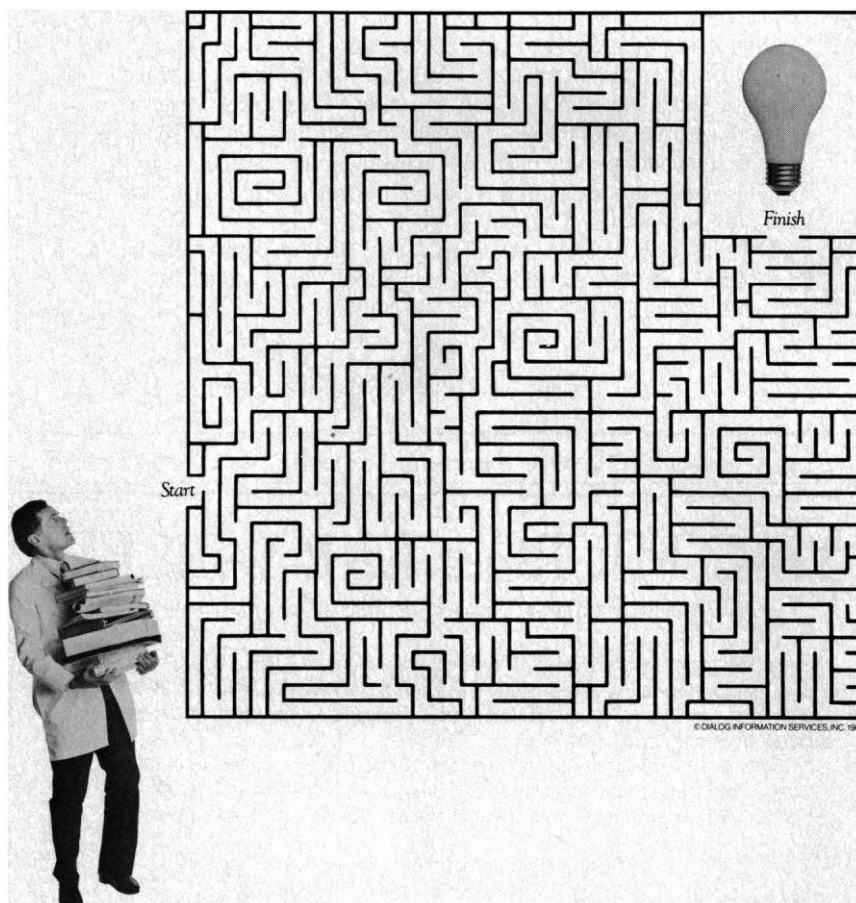
Seminars will run from 9:00 a.m. to 3:00 p.m., unless otherwise noted, and will include a complimentary lunch. There is no charge, but space is limited. For reservations and details, call toll-free (800) 872-0071; in Massachusetts, (617) 275-5208.

MilliGen will also be conducting DNA/Peptide tutorials at the upcoming ASBC and FASEB meetings.

© 1987 Millipore Corporation

**MilliGen**  
Division of MILLIPORE

# When it comes to biotechnology research don't fight your way through the information maze.



If finding the right information on the latest patents, products and markets in biotechnology seems confusing, or if it takes too much valuable time, then you should know about DIALOG®.

Now you can quickly find the right information in databases such as CA SEARCH, with instant access to millions of articles indexed by Chemical Abstracts Service.

Or in SCISEARCH, offering a multidisciplinary index to the literature of science and technology. Or in BIOSIS PREVIEWS, providing worldwide coverage of research in life sciences.

And in EXCERPTA MEDICA, a leading resource for biomedical research. In fact, DIALOG saves valuable

research time by giving you instant access to over 275 databases with information on literally millions of products and much more. So you'll spend less time in the library and more time doing what you do best.

Your company may already be using DIALOG. Check to see. To get acquainted, DIALOG offers \$100 worth of free time to first time users. Just call 800-3-DIALOG. Or write DIALOG, 3460 Hillview Avenue, Palo Alto, CA 94304.

**DIALOG** INFORMATION SERVICES, INC.  
A SUBSIDIARY OF LOCKHEED CORP.

The world's largest online knowledgebank.

**800-3-DIALOG**

Circle No. 99 on Readers' Service Card

Polyacrylamide gel of unpurified oligonucleotides. Left to right: 31, 41, 65, 79, 109, 128, 140-mer.

## Meet the MilliGen 7500. The only DNA synthesizer with a 100-mer guarantee.

**A new level of performance for automated DNA synthesis.** High-efficiency  $\beta$ -cyanoethyl chemistry, reliable positive-displacement microdelivery and a new generation of versatile, intelligent software. The MilliGen 7500 takes automated DNA synthesis a step further, to give you purer probes, longer fragments—and the trouble-free operation your work demands. And we back it up with a guarantee to produce a 100-mer on your installed system, in your lab.

**MilliGen reagents, hardware and protocols are optimized for maximum yield, minimum cost per coupling.** Stepwise yields greater than 99%, 5-minute cycle times and frugal consumption of amidites and reagents bring the cost per base down to a new low level. Probes, primers and linkers produced on the MilliGen 7500 often require no

additional purification, and the high coupling efficiency makes it easier and more economical to produce even very long DNA fragments—100-, 120-, 140-mer and longer.

**Smart software keeps you in control. And even talks you out of errors.** A stand-alone IBM PC-AT (or, optionally, IBM compatible) computer gives you direct command of the innovative MilliGen Express-DNA™ software. In addition to a full array of pre-programmed and user-defined protocols, the system provides fully automated notebook

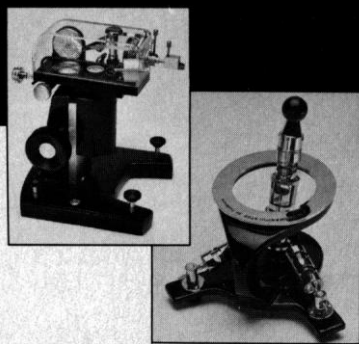
management, real time monitoring of all synthesis parameters, and self-diagnostic routines that identify problems before they occur. There's even a built-in "lab assistant"—a computer voice that reads back entered sequences for single-handed, error-free proofing.

**Get in touch with MilliGen.** To find out more, call toll-free (800) 872-0071; in Massachusetts, (617) 275-5208. Or circle the Reader Service Card. We'll send you a brochure that gives all the details about the MilliGen 7500. And we'll also include a protocol for the novel, time-saving methylene blue staining technique shown above.



**MilliGen**  
Division of MILLIPORE

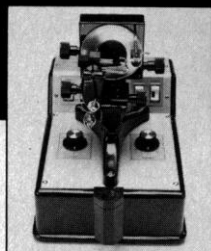
deFonbrune  
**MICROMANIPULATOR**



- Exclusive pneumatic joystick control
- X, Y and Z axis movement
- Essentially zero drift

Circle No. 141 on Readers' Service Card

deFonbrune  
**MICROFORGE**

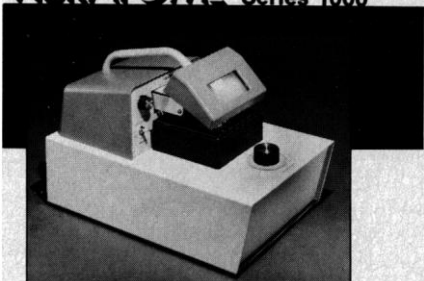


- 6 movement controls

- Accomplish contact fusion/melting, remote fusion, micro-forging, fracturing, micro-glass blowing, distant/contact stretching
- Forge/fabricate with glass, metals, alloys, organic crystals, polymers, other fusible materials

Circle No. 142 on Readers' Service Card

**VIBRATOME®** Series 1000



- Cuts fresh or fixed tissue evenly from 20 microns up
- Sections in fluid bath with vibrating blade
- Simple, precise adjustments

Circle No. 143 on Readers' Service Card

*Detailed literature available.*



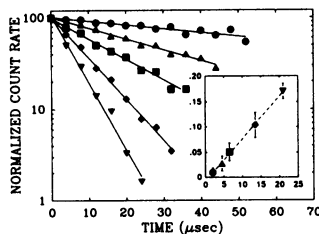
TECHNICAL  
PRODUCTS  
INTERNATIONAL, INC.

13795 RIDER TRAIL, SUITE 104, ST. LOUIS, MO 63045  
(314) 291-0198

**PUBLICATION  
QUALITY  
CHARTS AND  
GRAPHS**

**NEW VERSION 3.0!**

from your IBM PC, XT, AT  
and HP or compatible plotter.



**SIGMA PLOT™** software — \$350.

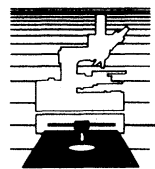
- Error bars
- Smooth Lines
- Clean diagonals
- Movable labels
- Log/semi-log scales
- Multiple graphs per page
- Curve fitting
- Laser printer support

Load data from keyboard, ASCII or DIF files (including LOTUS 123). Call or write for more information.

**JANDEL SCIENTIFIC**

MICROCOMPUTER TOOLS FOR THE SCIENTIST  
2656 Bridgeway, Sausalito, CA 94965  
800-874-1888 (outside CA)  
415-331-3022 (inside CA)

Circle No. 139 on Readers' Service Card



Templates and Extant Data

Data File Manager

Tutorial

Exit to D.O.S.

**BIOQUANT™ SYSTEM IV**

*The BEST Image Analysis Software*

The BQ System IV is a collection of image analysis products including simple morphometry, automated video-based analysis, autoradiography, microdensitometry, 3D reconstruction, and bone histomorphometry.

Since 1978 R & M Biometrics, Inc. has designed image analysis systems to satisfy research scientists in hundreds of research labs.

To see the best image analysis software, call us for a demonstration.



**BIOQUANT**

R & M BIOMETRICS, INC.

5611 Ohio Avenue • Nashville, TN 37209

615-269-9966

For a demonstration circle reader service number 163  
For literature circle reader service number 164

**IMAGE INTENSIFIER**

The KS-1380 is an image intensifier assembly for quantitative low light level video (usable signal at  $2 \times 10^{-7}$  fc). This modular assembly features manual and computer controlled externally adjustable and reproducible gain over a 200-fold range. The device has very low noise, 850 line horizontal resolution, less than 1% geometric distortion and gain uniformity <3% over the entire image area.

Spectral sensitivity ranges from 400-850nm with peak response at 600nm. The intensifier incorporates overload protection, low lag, and a linear input-output relationship. Life expectancy of tube 20,000 hours. The KS-1380 accepts any video camera with C-mount input. Performance of the system is equal or better than ISIT camera when a one inch newvicon tube camera or solid state camera with equal sensitivity is employed as the output detector.

**VIDEO  
SCOPE  
INTERNATIONAL, LTD.**

Video Scope International, Ltd.  
Box 17150  
Washington DC 20041



Circle No. 155 on Reader Service Card

## INTRODUCING PERGAMON'S NEWEST JOURNALS

### CLINICAL BIOCHEMISTRY

Now published by Pergamon on behalf of the  
Canadian Society of Clinical Chemists

Editors-in-Chief:

**D.M. Goldberg, M.D., Ph.D.,**

The Hospital for Sick Children, Toronto

**W.H.C. Walker, Ph.D.,** McMaster Medical Centre,

Hamilton

Volume 20, 1987

Published bi-monthly

**CLINICAL BIOCHEMISTRY** publishes articles and invited reviews relating to the applications of chemistry, biochemistry, immunology and molecular biology to clinical investigation and diagnosis, therapy and monitoring of human disease.

### FREE RADICAL BIOLOGY & MEDICINE

Editors-in-Chief:

**William A. Pryor, Ph.D.,** Louisiana State University

**Kelvin J.A. Davies, Ph.D.,** University of Southern California

Volume 3, 1987

Published bi-monthly

**JOURNAL OF FREE RADICALS IN BIOLOGY & MEDICINE** and **ADVANCES IN FREE RADICAL BIOLOGY AND MEDICINE** have been consolidated into this new journal to bring readers a centralized source for both original and review articles in the field of free radical research.

### REPRODUCTIVE TOXICOLOGY

Editor-in-Chief:

**Anthony R. Scialli, M.D.,**

Reproductive Toxicology Center, Washington, D.C.

Volume 1, 1987

Published quarterly

**REPRODUCTIVE TOXICOLOGY** publishes original research on the influence of chemical and physical agents on reproduction. Included in each subscription is membership to the Reproductive Toxicology Center, free access to the REPROTOX database (available in the United States and Canada), and for member physicians, the use of the Clinical Inquiry Program.

### TOXICOLOGY IN VITRO

Joint Editors:

**Dr. I.F.H. Purchase,**

Central Toxicology Laboratory, Macclesfield

**Dr. Gordon C. Hard,** BIBRA, Carshalton

Volume 1, 1987

Published quarterly

**TOXICOLOGY IN VITRO** will publish original research papers and occasional reviews on the use of *in vitro* techniques for determining the toxic effects of chemicals and elucidating their mechanisms of action.

To request a free sample copy and subscription information for these exciting publications, please contact the nearest Pergamon office.

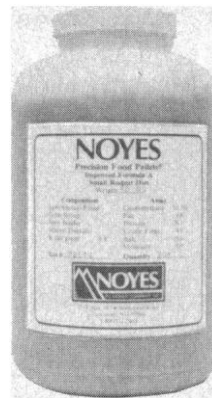
## PERGAMON JOURNALS

A member of the BPCCLC Group of companies

US: Maxwell House, Fairview Park, Elmsford, New York, 10523

UK: Headington Hill Hall, Oxford OX3 0BW, England

Circle No. 122 on Readers' Service Card



# NOYES

# PELLETS

## The Top of the Line in precision pelleted diets for laboratory animal research

For more information about standard and custom diets, including the incorporation of your test substance, in precision pellets from 20 mg to 3.5 g call **TOLL FREE**

# 800-522-2469

See us at **FASEB Booth 1123**



P.O. Box 381

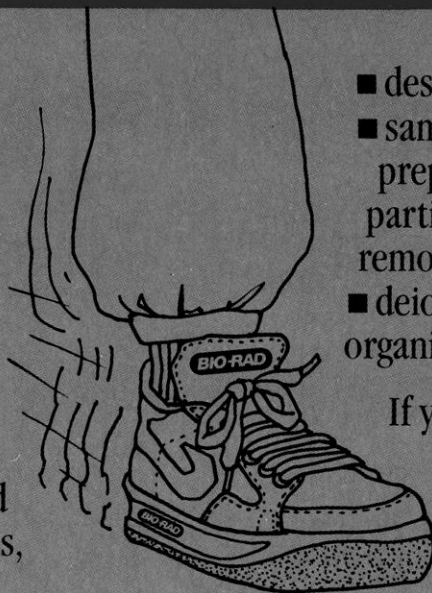
Lancaster, NH 03584

Circle No. 150 on Readers' Service Card

# Start your separations off on the right foot.

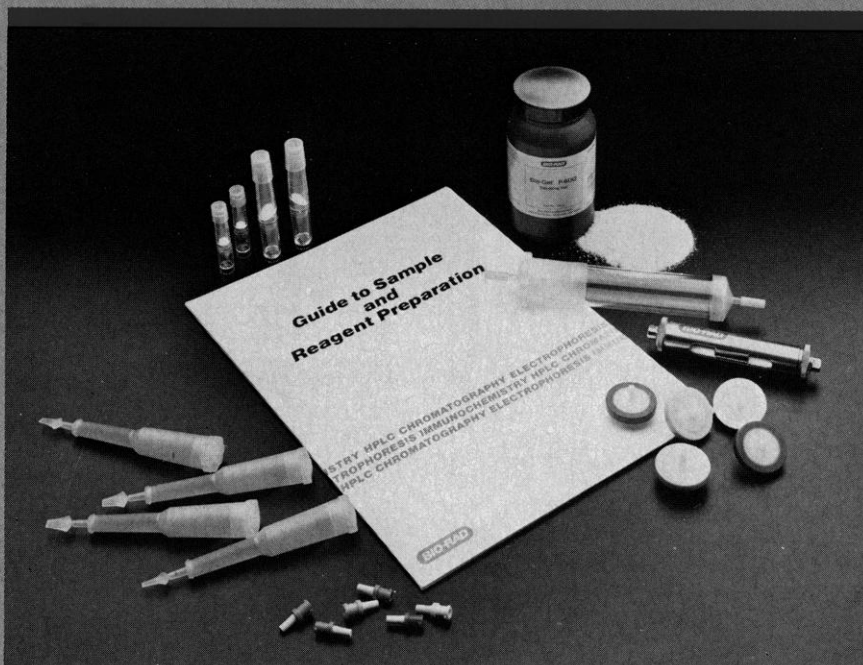
## Start with Bio-Rad's sample preparation products.

Almost every separation or analysis requires treatment of the sample. Because of this, Bio-Rad offers a complete line of quality sample preparation products. These well-established tools include ion exchange resins, filtration products, disposable columns, and cartridges. Among the many sample prep applications that we satisfy are:



- desalting ■ buffer exchange
- sample concentration ■ buffer preparation ■ metal removal ■ particulate removal ■ detergent removal ■ deproteinization
- deionization ■ adsorption of organics ■ HPLC deashing

If you're involved in chromatography, electrophoresis, immunochemistry, molecular biology, or HPLC, you'll find the "Guide to Sample and Reagent Preparation" invaluable. Contact us for your free copy.



**BIO-RAD**

1414 Harbour Way South  
Richmond, CA 94804  
(415) 232-7000  
800-4-BIO-RAD

Also in Rockville Centre, NY; Hornsby, Australia; Vienna, Austria; Mississauga, Canada; Watford, England; Munich, Germany; Milan, Italy; Tokyo, Japan; Utrecht, The Netherlands; and Glattbrugg, Switzerland.

**Answers.**

# Eppendorf Ultra Micro Pipettes

## From 0.5 $\mu\text{L}$ ...ultra micro accuracy by design.

Eppendorf brings superior performance and the convenience of air displacement to ultra micro pipetting. All Eppendorf Ultra Micro Pipettes feature a unique extended piston design that reduces dead-air volume and assures *no carryover* between samples. The result? Great accuracy at ultra micro settings.



## Guaranteed performance in continuously adjustable and fixed-volume models.

The Eppendorf Ultra Micro Digital Pipette is the *only* continuously adjustable air displacement pipette with guaranteed performance from 0.5 to 10  $\mu\text{L}$ . Just twist the control button at the top of the pipette to select the desired volume, and

a "click-set" ratchet mechanism will lock the volume in place—making accidental changes practically impossible. Four Eppendorf Ultra Micro Fixed-Volume Models, with built-in tip ejector, handle volumes of 1, 2, 5, and 10  $\mu\text{L}$ .



## For your other pipetting needs...up to 1000 $\mu\text{L}$ .



For volumes from 2.0 to 1000  $\mu\text{L}$ , three additional Eppendorf Digital Pipettes give you direct digital display of the set volume to assure precise, reproducible results every time. And all Eppendorf Digital Pipettes feature a "click-set" ratchet mechanism, maintenance-free seals, and a tip ejector.

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

**eppendorf**

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

# Top performance starts at the bottom.

For literature circle reader service number 53  
For a demonstration circle reader service number 54

# Don't Be Left Holding The Bag.



**“What do you mean it doesn't grow your cells?  
I made it with the same powdered media as the last time.”**

If you are using powdered media, chances are you're introducing many variables to your work. Don't be surprised. Just because you prepare your medium the same way every time doesn't mean that it is always the same. Unforeseen problems could be introduced in your water system in the form of endotoxin, microbial and chemical contaminants. Additional problems could result from airborne particulates in your hood, particulates and bioburden in your caps, bioburden and residue in your bottles, and variability introduced by the powdered media.

So, the next time you run an experiment, the medium you take for granted could be letting you down.

The solution to this problem is our quality liquid media. At Whittaker M.A. Bioproducts we routinely

monitor all aspects of production. The quality of air in our aseptic filling core is precisely controlled. The defined oven load configurations used in production have been validated for sterilization effectiveness. Our water system is tested daily and its endotoxin levels are lower than water for injection standards.

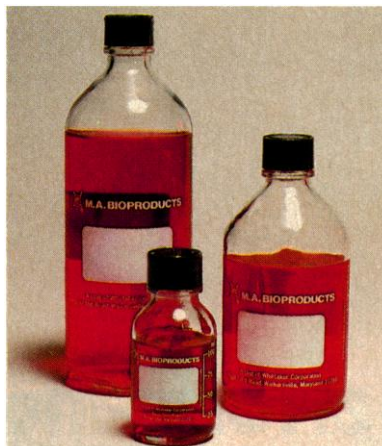
Hundreds of Standard Operating Procedures are in place to assure you consistent, quality products. And none of our media are prepared from reconstituted powder.

The next time you consider using powdered media choose quality liquid media from Whittaker M.A. Bioproducts. **We won't leave you holding the bag.**

Telephone toll free,  
800-638-8174.

In Maryland, 800-231-3352.

In Washington, D.C. Metro,  
800-426-7811.



## **Whittaker M.A. Bioproducts**

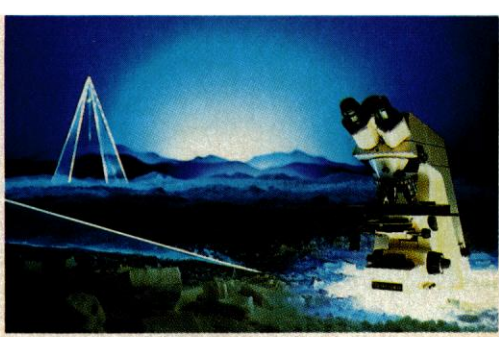
P.O. Box 127, Biggs Ford Road • Walkersville, MD 21793 • (301) 898-7025

Circle No. 167 on Readers' Service Card

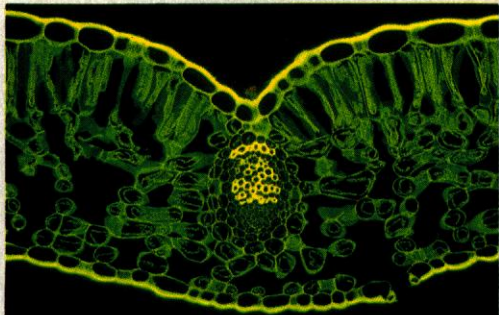


THE MORE-THAN-ROUTINE MICROSCOPE: AXIOSKOP

# THE NEW ZEISS AGE IN MICROSCOPY CONTINUES.



In 1986 a new Zeiss age in microscopy dawned with the Pyramids of Zeiss – the *Axioplan*, *Axiophot*, and *Axiotron* microscopes. Now Carl Zeiss expands the series: The more-than-routine microscope: *Axioskop*.



Demanding routine becomes easy: examinations of stained or unstained cells and tissue, fluorescence-stained specimens, specimens with primary fluorescence.

For literature circle reader service number 83  
For a demonstration circle reader service number 84

Zeiss *Axioskop* with innovations to make microscopy more efficient: ICS-optics for high-contrast, bright, color-true images. SI-architecture for multi-purpose flexibility. Ergonomical design for fatigue-free hours of work.

Zeiss *Axioskop*  
For demanding routine microscopy - and more!  
Superb ICS-optics  
The Infinity Color-Corrected System, with newly computed optics from light source to eyepieces. Objectives with infinite image distance. For color-corrected and astigmatism-free images with a consistent large 20 mm

field of view. Ideal for scanning and observation of details. High image quality in all techniques.  
Flexible SI-architecture  
System-Integration of all microscopy techniques into the microscope for rapid change from any one method to any other. In seconds, with no performance loss, no compromises.

Reliable photomicrography and TV  
35 mm, large format, instant photography are all easy with the MC 63 S microscope camera.  
TV cameras readily accepted. The stability of the Pyramids.

Carl Zeiss, Inc.  
Thornwood, NY 10594  
(914) 747-1800

**The Pyramids of Zeiss:  
The new Geometry for Microscopes**





## How to close the critical gap between measurement

© 1987 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Lotus Measure is a trademark of Lotus Development Corporation. System Requirements:

### **The *NEW GENERATION* Biological Safety Cabinet**

In one state-of-the-art safety cabinet NuAire offers you the Best Protection for Laboratory Personnel, the Best Protection against Product Contamination, and proprietary Technology that makes the **LABGARD 425** the #1 selling Biological Safety Cabinet in the world. The benefits are impressive:

- SAFER TO USE ■
- EASIER TO OPERATE ■
- MORE ENERGY EFFICIENT ■
- AFFORDABLY PRICED ■

This new safety cabinet combines all of the performance and quality features that make NuAire products the finest you can purchase.

Learn more about **The *NEW GENERATION* LABGARD 425**

Call toll-free 1-800-328-3352.

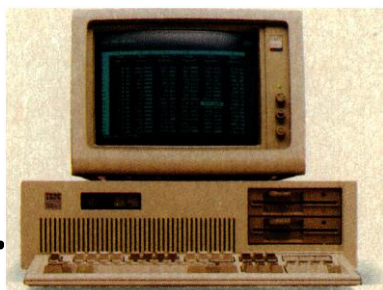
**WE'RE QUIETLY... THE LEADER!**

**Another NuAire First!**

**LABGARD 425 Class II Type A/B<sub>3</sub> Biological Safety Cabinet. UL Listed. Exceeds NSF Standard No. 49.**

**NUAIRE**  
NUAIRE, INC.  
2100 FERNBROOK LANE, PLYMOUTH, MN 55441 U.S.A.  
1-800-328-3352 IN MN 612-553-1270 TELEX: 29-0781

hardware and 1-2-3.



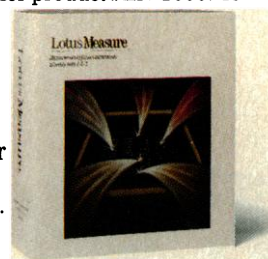
Measurement hardware and Lotus® 1-2-3® have been too far apart for too long. Because until now, to get data from instruments into 1-2-3 you had to do it manually or write your own program.

Lotus Measure™ is the first software that seamlessly moves data from measurement hardware directly into 1-2-3 in real time, for immediate display, analysis and storage.

Measure was designed to work as part of 1-2-3, so you'll recognize the familiar 1-2-3 interface. You can even run Measure from 1-2-3 macros.

Measure works with over 8,000 kinds of instruments, in hundreds of applications, managing intelligent instruments over the IEEE-488 or RS-232-C interface bus, or handling A/D boards directly.

Call 1-800-345-1043 to buy your copy of Lotus Measure and ask for product #EN-1666. To order the complete Measure demo package for a \$10 cost that's refundable with purchase, call and ask for demo #EN-1674. Or, for more information ask for brochure #EN-1740.



Lotus Measure™

IBM® PC, XT,™ AT, HP Vectra™ PC or COMPAQ® Portable; 512 K RAM; DOS 2.0 or higher; 1-2-3® Rel. 2.0 or higher. Data collection hardware not included. Demo disk requires DOS 2.0 or higher and IBM or compatible PC.

Circle No. 121 on Readers' Service Card

## THE ULTIMATE IN SPEEDVAC-ING. A290.

The centrifugal evaporator, concentrator and dryer that gives you 100% recovery, 100% of the time—now gives you the consistency and productivity of 100% automation.

### **AUTOMATED PROCESS CONTROLS.**

Assure highly reproducible end-point dryness, batch-to-batch consistency, and GMP compliance.

### **PROTECTS COSTLY SAMPLES.**

Automatic sequencing concentrates up to 200 samples identically run after run. Fail safe controls avoid operator error. Each sample processed at optimum temperature to a preset dryness.

### **TOTAL VERSATILITY.**

SpeedVac processes both organic and aqueous solvents. *In Clinical Labs:* sample preparation in drug testing. *In Bio-Manufacturing:* improves consistency, and extends product shelf-life. *In Life Sciences Research:* greater reproducibility, accuracy and sensitivity for HPLC, GC/MS, TLC and immunoassay.

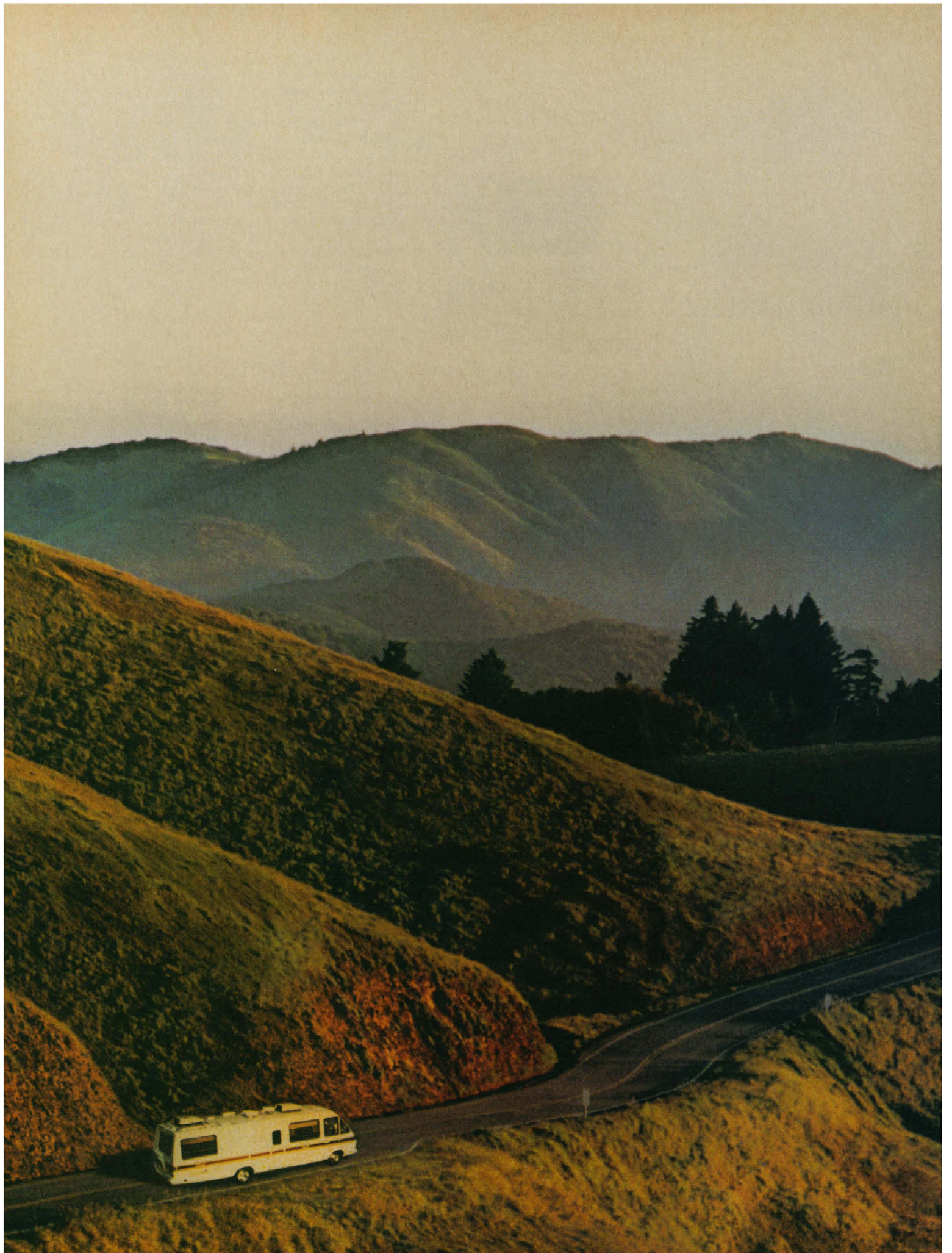
For full details contact:  
SAVANT Instruments, Inc.  
110-103 Bi-County Boulevard  
Farmingdale, NY 11735  
(516) 249-4600 TELEX: 6973199 SAVANT UW

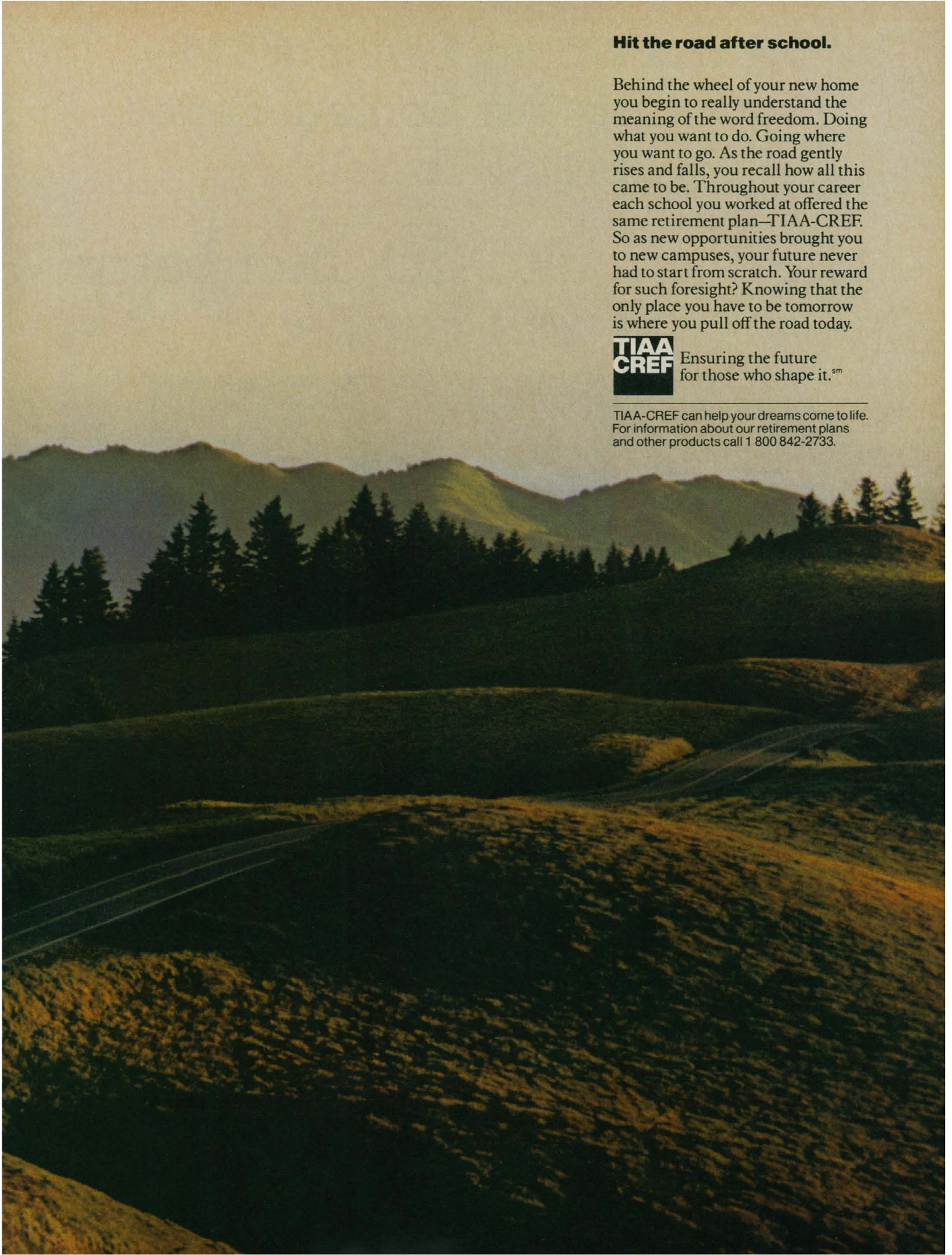
**SAVANT**  
For Sample Preparation.



Circle No. 173 on Readers' Service Card

SAVANT  
INSTRUMENTS, INC.





**Hit the road after school.**

Behind the wheel of your new home you begin to really understand the meaning of the word freedom. Doing what you want to do. Going where you want to go. As the road gently rises and falls, you recall how all this came to be. Throughout your career each school you worked at offered the same retirement plan—TIAA-CREF. So as new opportunities brought you to new campuses, your future never had to start from scratch. Your reward for such foresight? Knowing that the only place you have to be tomorrow is where you pull off the road today.



Ensuring the future  
for those who shape it.<sup>sm</sup>

---

TIAA-CREF can help your dreams come to life.  
For information about our retirement plans  
and other products call 1 800 842-2733.

HEPA Filtered. Laminar Flow.  
Proven Against Contamination.  
Priced To Sell.

## The Stericult™ CO<sub>2</sub> Incubator From Forma

Nobody has a perfect laboratory environment. That's why Forma designed the Stericult cell culture incubator. It's the most forgiving CO<sub>2</sub> incubator you'll ever use.

The Stericult offers stiff resistance to molds, yeasts, spores and fungi that cause costly culture losses and downtime.

The HEPA filter and **true laminar air flow** combine to inhibit migration of airborne organisms and to eliminate cross contamination and desiccation. Yet it's simple to operate, with automatic gas, temperature and humidity control. Our infrared CO<sub>2</sub> sensor gives you precise, cost-efficient CO<sub>2</sub> control with faster recovery after door openings.

The seamless interior is clean and free of hardware, with a flexible inventory system that provides ideal **in vitro** uniformity at all shelf levels, even fully loaded.

But the real beauty is in the performance. Which is why you'll want to know more about the advantages of owning a Stericult. Even if your environment is . . . perfect.

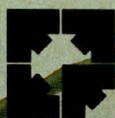
**Free Offer!**

A handcrafted silk rose, for your time and interest in the Stericult Cell Culture Incubator. Contamination performance tests, detailed specifications and attractive prices are available now.

Call us today, toll-free.



Call Us!



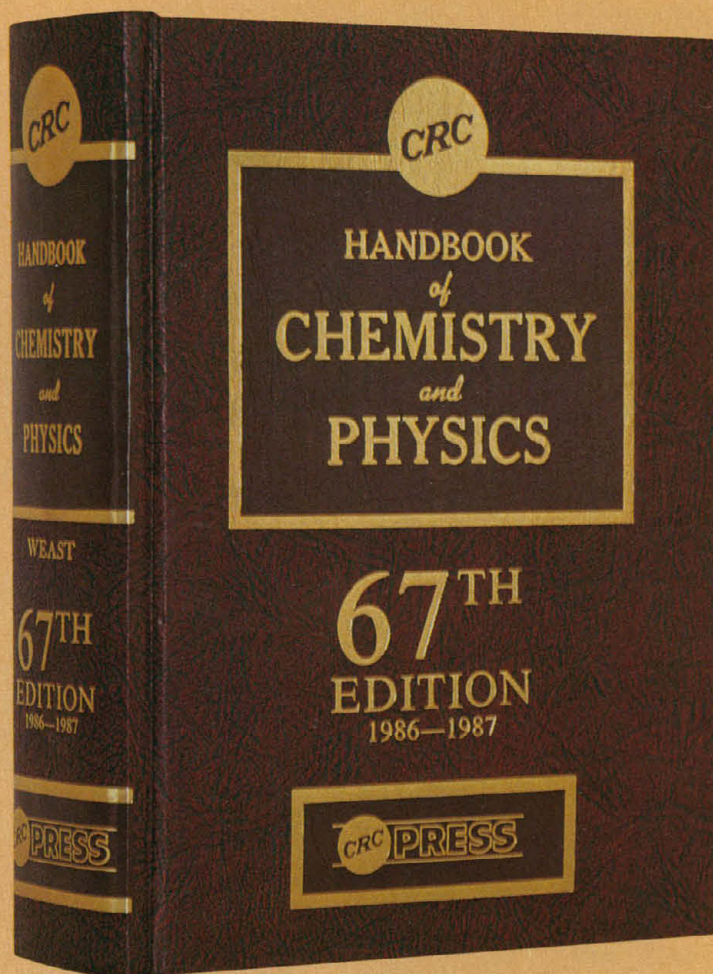
**Forma Scientific**

DIVISION OF MALLINCKRODT, INC.

BOX 649 MARIETTA, OH 45750 TELEX 29-8205

Toll-Free USA and Canada **800-848-3080**

Circle No. 16 on Readers' Service Card



# SAVE 50%

The most recent edition of the *CRC Handbook of Chemistry and Physics* is being offered for a limited time only at less than half price — that's \$35.00 off the regular price of \$69.95.

Each year *The Handbook* is reviewed and revised by an international panel of authorities, placing it among the most complete and up-to-date references available to scientists worldwide.

You'll quickly find what you're looking for in this comprehensive resource of over 2424 pages of graphs, tables, formulas, and property information.

## NOW ONLY \$34.95

### ORDER FORM

Rush me the 67th Edition of the *CRC Handbook of Chemistry and Physics* for only \$34.95\* (regularly \$69.95).  
To qualify for this special offer, each order should:

- be postmarked by May 15, 1987
- specify catalog no. 467KMK
- be prepaid by check, money order, or charged to one of the credit cards below

Enclosed is my check/money order for \$\_\_\_\_\_

American Express  MasterCard  Visa

Name\_\_\_\_\_

Account # (include all digits)

Co./Inst.\_\_\_\_\_

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Address\_\_\_\_\_

Expiration Date\_\_\_\_\_ Validation Date (AMEX) \_\_\_\_\_

City\_\_\_\_\_ State\_\_\_\_\_ Zip\_\_\_\_\_

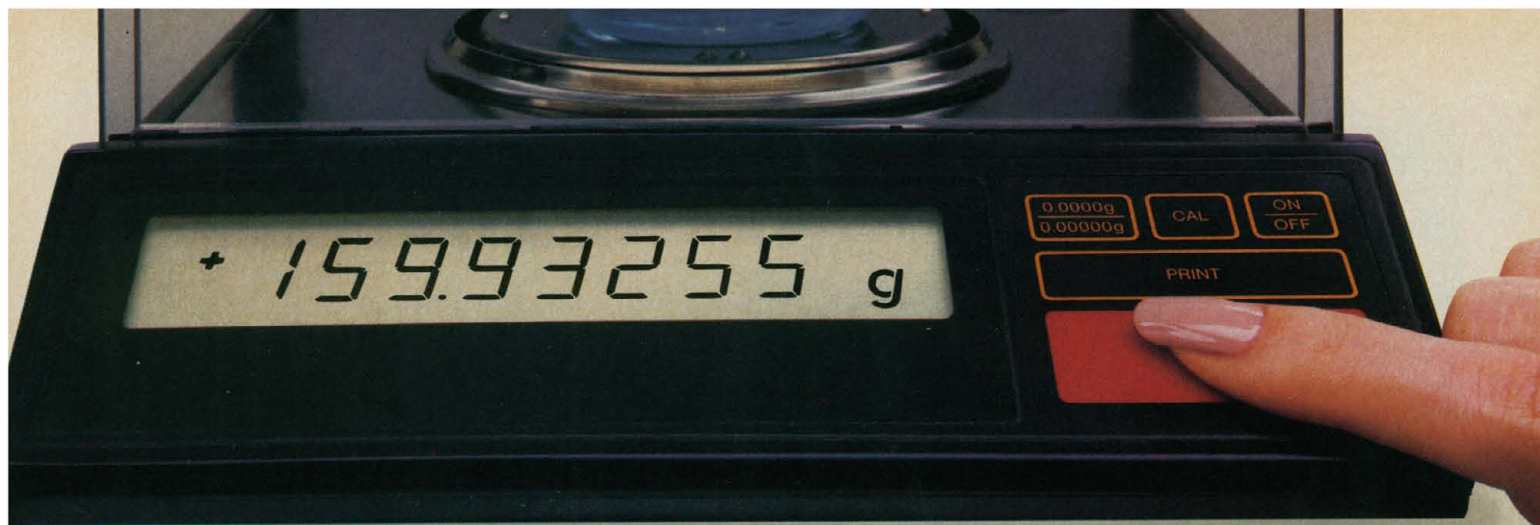
Signature (required for credit card orders). Please use ink.

\*Outside U.S., \$39.95 per copy. Payable in U.S. currency or draft on a U.S. bank. Florida residents add 5% sales tax.

\_\_\_\_\_  
Please print name appearing on credit card.

Order TOLL FREE 1-800-272-7737 • Monday-Friday • 8:30 a.m. to 5 p.m. (In Florida call collect: 1-305-994-0563.)

**CRC PRESS, INC.** 2000 Corporate Blvd., N.W. Boca Raton, Florida 33431



# SARTORIUS.

## The future is in the balance.

**The most advanced analytical balance: a toploader with 160 g capacity, full-range precise readability, and ultra-fast LCD readout.**

The new Sartorius R160P gives you features so advanced, they outweigh those of any other balance. Features that add up to toploader convenience and stability with semi-micro accuracy.

**New advanced-generation LCD readout.**

Larger, easier to read, crisper, with no distracting flicker. And ultra-fast update speed so you'll never again overshoot target weight during formulation or fill weighing.

**Comprehensive data displays.**

In plain language—like POWER OFF, STANDBY, BUSY, CAL (calibration), or *g* (stable weight). And internal programs to let you select from a wide range of mass unit conversions.

**New extra-accessible weighing chamber.**

The sides and top of the R160P slide completely back to give you unrestricted access. Now, weigh bulky objects easily and pipette directly into large vessels on the weighing pan.

**Poly-Range: readability matched to weighing range.**

It's the broadest, most adaptable weighing range available: automatically activated, predetermined

accuracy over the full 160 g weighing range. The R160P returns to weighing mode automatically.

**Sartorius leads the weigh.**

Take advantage of the ultimate in electronic balance performance with the new Sartorius R160P—and a whole family of electronic Poly-Range Balances that cover every need, every application. Capacities up to 8 kg, readabilities down to 10 µg. Fast, comprehensive LCD readouts, compact design, complete single-touch front-panel control, optional computer/printer/keyboard interface (RS232C)—and economical prices. Now, as always, Sartorius leads the weigh. For more information or a demonstration: call 800-645-3050; in New York, 516-334-7500. Or write Brinkmann Instruments, Inc., Cantiague Road, Westbury, NY 11590.



New Sartorius Poly-Range Balances

readability levels. Get the most sensitive level any time simply by taring.

**Single-touch front-panel operating ease.**

Control all functions from the front panel. Switch on, program over 38 operational parameters, tare to zero, switch off. With one touch, calibrate to semi-micro

**Sartorius**

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



# The plain truth about pipet tips

It's what you *can't* see that guarantees a high quality pipet tip.

Our craftsmen follow this creed:

- Know what's needed and know how to produce it.
- Be willing to invest the effort required.
- Be efficient, but don't sacrifice quality for low cost.
- Examine your work critically as if it were someone else's.
- Then submit it to quality control.



You can buy cheap pipet tips, but the ones you discard cost money and the ones you don't cost peace of mind. We offer the largest selection of high quality pipet tips in the world, all made by expert craftsmen. Contact us for the latest price list on disposables for liquid handling.



**BIO-RAD**

1414 Harbour Way South  
Richmond, CA 94804  
(415) 232-7000  
800-4-BIO-RAD

Also in Rockville Centre, NY; Hornsby, Australia; Vienna, Austria; Mississauga, Canada; Watford, England; Munich, Germany; Milan, Italy; Tokyo, Japan; Utrecht, The Netherlands; and Glattbrugg, Switzerland.

**Answers.**

See us at FASEB Booth #918  
Circle No. 59 on Readers' Service Card



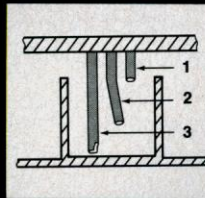
**SKATRON**

## WE CAN'T LEAVE WELL ENOUGH ALONE.

### A FASTER, MORE ADVANCED WASHING AND READING SYSTEM FOR EIA.



**96 Well Microwash**—Triple tube washing in each well for more thorough wash and aspiration. Digital switch minimizes reagent consumption. Semi-bevelled outlet tube permits thorough aspiration regardless of well shape, round or flat. User specific microchip program available.



**Easy Reader**—Easy programming and extremely flexible software; stores up to 15 different programs. High quality optics. Reads dual wavelength, 96 wells in 60 sec.

Call or write: Skatron Inc.  
P.O. Box 530, Sterling, VA 22170  
(800) 336-0191

Microwash is a registered trademark of Skatron Inc.

Circle No. 156 on Readers' Service Card

# Amersham check-list



**Amersham, the first name in research assays. All these kits are now available.**

## Cardiovascular

**NEW** [<sup>125</sup>I] Human  $\alpha$  ANP RIA  
**NEW** [<sup>125</sup>I] Human  $\alpha$  ANP RRA

## Cyclic nucleotides

[<sup>125</sup>I] cAMP (single range)  
 [<sup>125</sup>I] cAMP (dual range)  
 [<sup>3</sup>H] cAMP  
 [<sup>3</sup>H] cGMP

## Prostaglandins and related compounds

[<sup>3</sup>H] Prostaglandin F<sub>2 $\alpha$</sub>   
 [<sup>125</sup>I] 6-Keto-prostaglandin F<sub>1 $\alpha$</sub>   
 [<sup>3</sup>H] 6-Keto-prostaglandin F<sub>1 $\alpha$</sub>   
 [<sup>125</sup>I] Thromboxane B<sub>2</sub>  
 [<sup>3</sup>H] Thromboxane B<sub>2</sub>  
 [<sup>3</sup>H] Bicyclic prostaglandin E<sub>2</sub>

[<sup>3</sup>H] Leukotriene B<sub>4</sub>\*  
**NEW** [<sup>3</sup>H] Leukotriene C<sub>4</sub> specific  
**NEW** [<sup>3</sup>H] Leukotriene C<sub>4</sub>/D<sub>4</sub>/E<sub>4</sub>  
 [<sup>3</sup>H] Prostaglandin D<sub>2</sub>

## Complement

**NEW** [<sup>125</sup>I] Human Complement C3a des Arg  
**NEW** [<sup>125</sup>I] Human Complement C4a des Arg  
**NEW** [<sup>125</sup>I] Human Complement C5a des Arg

## Testosterone

[<sup>3</sup>H] Testosterone/Dihydrotestosterone

## Catecholamines

[<sup>3</sup>H] CAT-A-KIT™

## Vitamin D

[<sup>3</sup>H] 1 $\alpha$ , 25-Dihydroxy vitamin D  
 [<sup>3</sup>H] 25-Hydroxy vitamin D

## Amersham International plc

Amersham Place Little Chalfont  
 Buckinghamshire England HP7 9NA  
 telephone Little Chalfont (02404) 4444  
 telex 838818 ACTIVL G

\* By arrangement with Wellcome Diagnostics. CAT-A-KIT is a trademark of Amersham International plc.

# Amersham

**UK Sales** Aylesbury (0296) 395222 **Amersham Australia PTY Ltd** Sydney 888-2288 **Amersham Belgium SA/NV** Brussels (2) 538 9194  
**Amersham Buchler GmbH & Co KG** Braunschweig West Germany (05307) 8080 **Amersham Canada Ltd** Ontario (416) 842 2720  
**Amersham Corporation** Arlington Heights USA (312) 364 7100 **Amersham Denmark ApS** Birkerød (02) 82 0222 **Amersham France SA** Paris (1) 69.28.83.00  
**Amersham Japan** Tokyo (03) 816 6161 **Amersham Nederland BV** Houten 03403 76660 **Amersham Sweden AB** Solna (8) 734 0800

Circle No. 130 on Readers' Service Card