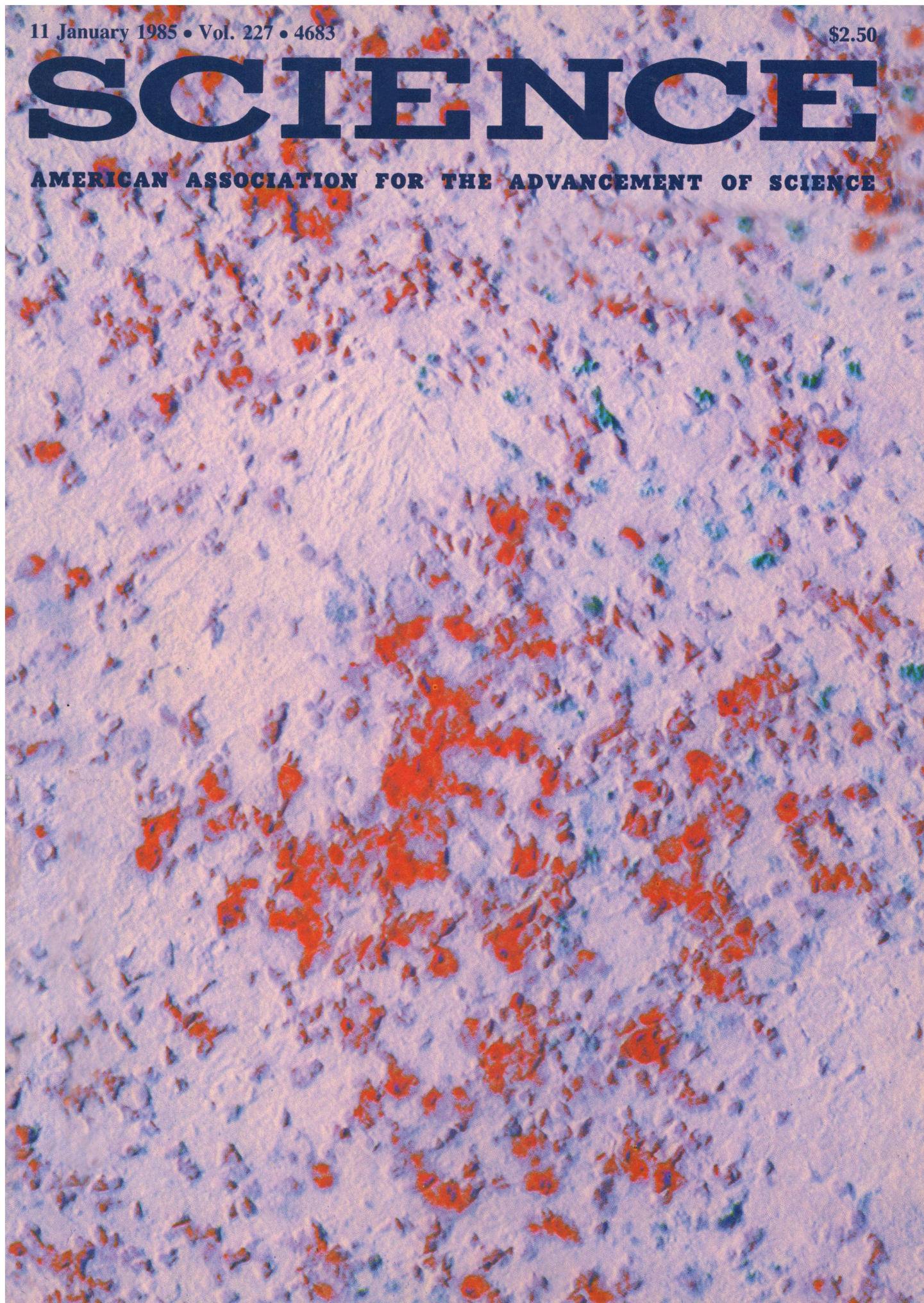


11 January 1985 • Vol. 227 • 4683

\$2.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





Now Even More Choices for J2-21 High-Speed Centrifuge Users

Three New Rotors

One is the JS-13.1 with six swinging buckets for 50-mL tubes, so you can run 50% more sample than before. There's the JA-18 fixed angle rotor that spins ten 100-mL tubes at forces to 47,900 g —ideal for pelleting. And, the first of its kind, the 24-place JA-18.1 that lets you process microcentrifuge-sized tubes in the refrigerated J2-21 at triple the g force of a microcentrifuge.

Another J2-21 Model

The new J2-21M/E is the perfect intermediary. It offers the programmable controls of the

top-of-the-line J2-21M and the economy of the J2-21 analog model with its rugged brush drive. There's a choice of three acceleration and deceleration rates too.

Alternative Purchase Plans

Beckman offers a wide choice of trade-in, lease and specially tailored financial programs which make it easy to update your lab with new equipment.

No wonder the J2-21's are the high-speed centrifuges of choice!

For more information write: Beckman Instruments, Inc., 1050 Page Mill Road, Palo Alto, CA 94304; or Beckman Instruments International, S.A., P.O. Box 76, 1211 Geneva 6, Switzerland.



BECKMAN

Circle No. 60 on Readers' Service Card

The one enhancer for all your gels



Our improved EN³HANCE™ Autoradiography Enhancer
is the only one you really need on your shelf.

It's effective with all common types of gels—agarose, polyacrylamide, or mixed,
thick or thin—and with all of them you get outstanding resolution and sensitivity.

For more details, contact your Du Pont NEN Research Products
representative today. Or get our technical brochure, plus a free Guide to
Fluorography Enhancement, by calling toll free: 800-225-1572.
(In Mass. and international: 617-482-9595.)

Circle No. 105 on Readers' Service Card

NEN Research Products



LETTERS	Trypanosomiasis Research: <i>D. E. Vermeer; D. H. Ferris; C. J. Bacchi and A. B. Clarkson, Jr.</i> ; Biological and Chemical Warfare: <i>B. H. Rosenberg</i> ; Chemical Information Online: <i>A. E. Fein</i>	118
EDITORIAL	An Editor's Quest (I)	123
ARTICLES	Laser-Induced Fluorescence and Bonding of Metal Dimers: <i>V. E. Bondybey</i>	125
	The 1984 Nobel Prize in Physics: <i>L. M. Lederman and R. F. Schwitters</i>	131
	B Lineage-Specific Interactions of an Immunoglobulin Enhancer with Cellular Factors in Vivo: <i>A. Ephrussi et al.</i>	134
	Mutation in LDL Receptor: Alu-Alu Recombination Deletes Exons Encoding Transmembrane and Cytoplasmic Domains: <i>M. A. Lehrman et al.</i>	140
NEWS AND COMMENT	ADAMHA Funding Pressed	147
	Restoration of the Humanities Urged	149
	New R&D Centers Will Test University Ties	150
	<i>Briefing</i> : Garrison Compromise Proposed; Industry-Academia Cooperation Touted; Press Calls for End of Special Lobbying; New Curriculum at Harvard Medical School; Monsanto May Bypass NIH in Microbe Test	152
RESEARCH NEWS	A Rescue for Wisconsin's Synchrotron Source	154
	More Progress on the HTLV Family	156

BOARD OF DIRECTORS

ANNA J. HARRISON
Retiring President, Chairman

DAVID A. HAMBURG
President

GERARD PIEL
President-Elect

ROBERT W. BERLINER
LAWRENCE BOGORAD

WALTER E. MASSEY
DOROTHY NELKIN

CHAIRMEN AND SECRETARIES OF AAAS SECTIONS

MATHEMATICS (A)
Gail S. Young
Lynn Arthur Steen

PHYSICS (B)
Chen Ning Yang
Rolf M. Sinclair

CHEMISTRY (C)
Fred W. McLafferty
Jean'ne M. Shreeve

ASTRONOMY (D)
Patrick Palmer
Donat G. Wentzel

PSYCHOLOGY (J)
Gregory A. Kimble
William N. Dember

SOCIAL, ECONOMIC, AND POLITICAL SCIENCES (K)
Robin M. Williams, Jr.
David L. Sills

HISTORY AND PHILOSOPHY OF SCIENCE (L)
Wesley C. Salmon
David L. Hull

ENGINEERING (M)
Raymond L. Bisplingh
W. Edward Lear

EDUCATION (Q)
Marvin Druger
Joseph D. Novak

DENTISTRY (R)
Robert J. Fitzgerald
Harold M. Fullmer

PHARMACEUTICAL SCIENCES (S)
Stuart Feldman
David A. Knapp

INFORMATION, COMPUTING, AND COMMUNICATIONS (T)
Joseph Becker
Madeline M. Henderson

DIVISIONS

ARCTIC DIVISION

Robert White
President

Gunter E. Weller
Executive Secretary

PACIFIC DIVISION

Walter Gardner
President

Alan E. Leviton
Executive Director

SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION

Charles E. Holley, Jr.
President

M. Michelle B.
Executive Dir

SCIENCE is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Second-class postage (publication No. 484460) paid at Washington, D.C., and at an additional entry. Now combined with **The Scientific Monthly**® Copyright © 1985 by the American Association for the Advancement of Science. Domestic individual membership and subscription (51 issues): \$56. Domestic institutional subscription (51 issues): \$93. Foreign postage extra: Canada \$24, 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 \$3 (\$3.50 by mail); Biotechnology issue, \$5 (\$5.50 by mail); classroom rates on request. **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*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BOOK REVIEWS	Saturn, reviewed by A. F. Cheng; The Microbe 1984, M. Schaechter and J. M. Coffin; Dear Lord Rothschild, S. J. Gould; The Barbary Macaque, A. A. Eudey; Biogeography and Ecology of the Seychelles Islands, L. G. Abele; Books Received	158
REPORTS	Phytoplankton Bloom Produced by a Receding Ice Edge in the Ross Sea: Spatial Coherence with the Density Field: W. O. Smith and D. M. Nelson	163
	Sea-Floor Hydrothermal Activity Links Climate to Tectonics: The Eocene Carbon Dioxide Greenhouse: R. M. Owen and D. K. Rea	166
	<i>Plasmodium falciparum</i> Malaria: Band 3 as a Possible Receptor During Invasion of Human Erythrocytes: V. C. N. Okoye and V. Bennett	169
	<i>Trans</i> -Acting Transcriptional Regulation of Human T-Cell Leukemia Virus Type III Long Terminal Repeat: J. Sodroski et al.	171
	Sequence Homology and Morphologic Similarity of HTLV-III and Visna Virus, a Pathogenic Lentivirus: M. A. Gonda et al.	173
	HTLV-III Infection in Brains of Children and Adults with AIDS Encephalopathy: G. M. Shaw et al.	177
	Targeted Modulation of Acute Inflammation: D. F. Ranney	182
	Coupling of Action Potential Activity Between Unmyelinated Fibers in the Peripheral Nerve of Monkey: R. A. Meyer, S. N. Raja, J. N. Campbell	184
	Do Frogs Communicate with Seismic Signals? E. R. Lewis and P. M. Narins	187
	Detection of Two Viral Genomes in Single Cells by Double-Label Hybridization in Situ and Color Microradioautography: A. T. Haase et al.	189
	Dinoflagellate with Blue-Green Chloroplasts Derived from an Endosymbiotic Eukaryote: L. W. Wilcox and G. J. Wedemayer	192
	Evoked Mechanical Responses of Isolated Cochlear Outer Hair Cells: W. E. Brownell et al.	194

B. SLAUGHTER E. SAWYER	SHEILA E. WIDNALL LINDA S. WILSON	WILLIAM T. GOLDEN Treasurer	WILLIAM D. CAREY Executive Officer
OGY AND GEOGRAPHY (E) W. Hay nas Dufro, Jr.	BIOLOGICAL SCIENCES (G) Dorothy M. Skinner Walter Chavin	ANTHROPOLOGY (H) James Silverberg Priscilla Reining	
AL SCIENCES (N) A. Good an E. Rhoads	AGRICULTURE (O) John Pesek Ralph J. McCracken	INDUSTRIAL SCIENCE (P) J. Kenneth Craver Robert L. Stern	
STICS (U) a A. Bailar J. J. Wegman	ATMOSPHERIC AND HYDROSPHERIC (W) William W. Kellogg Bernice Ackerman	GENERAL (X) George C. Sponsler Rodney W. Nichols	

COVER

Computer-enhanced, light micrograph of a spleen tissue section containing microspheres (blue) consisting of albumin, magnetite, and an entrapped peptide messenger. The microspheres were injected intravenously and became localized in the spleen. Here, the release of the messenger results in attraction of blood neutrophils (red), which accumulate around the spheres and become activated to enhance the local resistance to infection. See page 182. [D. F. Ranney, University of Texas Health Science Center, Dallas, Texas 75235]

American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to promote 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.

With a Waters PICO-TAG™ Amino Acid Analysis System you get a protein isolation system . . . free.



The Waters PICO-TAG Amino Acid Analysis System that was described as "spectacular for routine analysis"¹ just got better. Now this same system will isolate your proteins and peptides in just minutes with higher resolution, purity and recovery.

For the first time it's easy and practical for you to purify your protein today and have a com-

plete amino acid compositional analysis by the next day, *using a single HPLC system*. And, switching from protein isolation to amino acid analysis is fast and uncomplicated—simply change the column and elution buffers.

See for yourself how Waters PICO-TAG Amino Acid Analysis System gives the protein research laboratory "... lowered ... routine sensitivity by a factor of 50 and ... reduced analysis time

from 2 hours to 20 minutes."² Call Waters Life Science Group today at (617) 478-2000, Ext. 2665.

¹Thomas H. Maugh II, "New Tool for Amino Acid Analysis," *Science*, 6 July 1984, Vol. 225, No. 4657, p. 42.

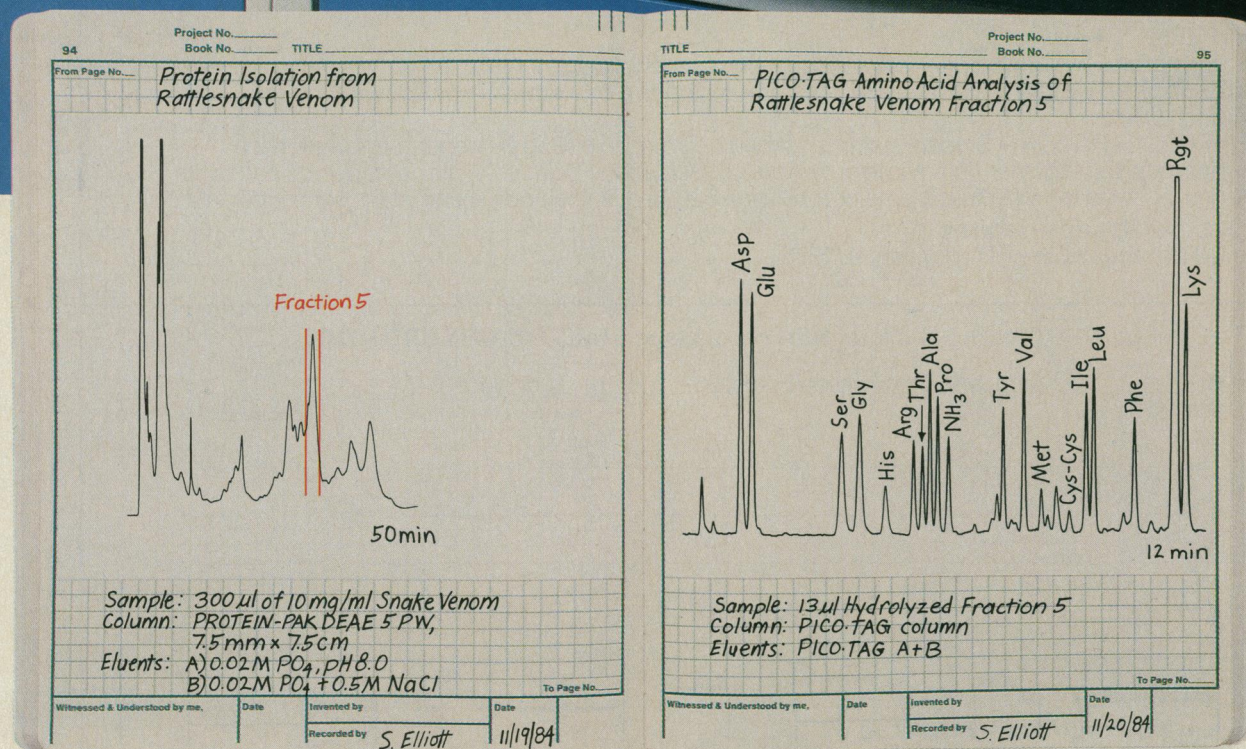
²*Ibid.*

The references cited in this advertisement do not imply endorsement by *Science Magazine* or AAAS.

MILLIPORE

Waters Chromatography Division

Circle No. 63 on Readers' Service Card



THE FIFTH ANNUAL CONGRESS FOR
RECOMBINANT DNA RESEARCH
FEBRUARY 3-6, 1985
SAN FRANCISCO HILTON, SAN FRANCISCO, CALIFORNIA

Co-Chairmen:

John D. Baxter
Univ. of California
San Francisco, CA

Walter Miller
Univ. of California
San Francisco, CA

Thomas Shenk
State Univ. of New York
Stony Brook, NY

The Annual Congress for Recombinant DNA Research, now in its fifth year, is recognized as the premier symposium on the subject, and presents the important developments that impact on current and future work.

Keynote Speakers: Walter Gehring, Biozentrum, Basel, Switzerland
HOMEOTIC GENES AND THE CONTROL OF DEVELOPMENT
Thomas Maniatis, Harvard University, Cambridge, MA
MECHANISMS OF RNA SPLICING

Session Chairman

CONTROL OF GENE EXPRESSION
Thomas Shenk, Princeton University, Princeton, NJ

MOLECULAR BIOLOGY OF HUMAN DISEASE
Walter Miller, University of California,
San Francisco, CA

PROTEIN STRUCTURE AND FUNCTION
Robert Sauer, Massachusetts Institute of Technology,
Cambridge, MA

MOVABLE DNA ELEMENTS
Gerard Rubin, University of California, Berkeley, CA

PLANT MOLECULAR BIOLOGY
Robert Goldberg, University of California, Berkeley, CA

MECHANISMS OF PROTEIN SECRETION
Randy Schekman, University of California,
Berkeley, CA

RETROVIRUSES AND ONCOGENES
Arnold Levine, Princeton University, Princeton, NJ

INDUCIBLE SYSTEMS
John Baxter, University of California,
San Francisco, CA

Poster Sessions: ADVANCES IN RECOMBINANT DNA RESEARCH

Participants are invited to submit abstracts for the poster sessions. These abstracts will be reviewed up until the time of the meeting; however, only those accepted by Dec. 15 will be published in the journal, DNA. Contact Edward Ruffing, Scherago Associates, Inc., (212) 730-1050.

**Organized by Scherago Associates, Inc., in conjunction with
the journal, DNA, and Genetic Engineering News,
published by Mary Ann Liebert, Inc.**

REGISTRATION FEES:

\$400 On-site registration – includes a one year subscription or renewal to the journal, DNA.

\$350 ADVANCE REGISTRATION – (Received by Dec. 1) – Includes a one year subscription or renewal to the journal, DNA.

\$175 STUDENT REGISTRATION – Student status must be confirmed in writing by department chairman.

4-7 registrations received together from same organization \$300 each. Includes 4 journal subscriptions only.

8-10 registrations received together from same organization \$200 each. Includes 4 journal subscriptions only.

Larger group rates available upon request.

Cancellations must be received in writing by Jan. 9, 1985.

Attendance will be limited. Make checks payable to: **Scherago Assoc., Inc., DNA/HYBRIDOMA**

☐ Please reserve _____ space(s): Registration Fee of \$ _____ enclosed.

☐ Please send abstract form.

Name _____

Dept. _____

Organization _____

Street _____

City _____ State _____ Zip _____

Telephone: () _____

Return to: DNA; c/o Scherago Associates, Inc.

1515 Broadway, New York, NY 10036 • (212) 730-1050

OLYMPUS®

The Image of Quality



The BH-2 Series.

**Uniquely modular
to meet your
current and future
requirements.**

The quality of any microscope series relies on the interrelationship of optical performance, mechanical capability, electronic sophistication and its component system of accessories and attachments. For more than six decades, Olympus has dedicated itself to development of a unique fusion of these distinct disciplines. That is the Olympus advantage.

Nowhere is this advantage better exemplified than in the BH-2 System. A totally new generation, this highly advanced series represents a significant contribution to microscopy and photomicrography. Focusing that is smoother, more effortless and in a lower and more comfortable position; freely reachable controls for the stage that is positioned lower for easier processing of multiple specimens; vastly improved illumination for ultra-low magnification in Koehler-type illumination from 1X to 100X; accurate and unvarying brightness control; an advanced, automated photomicrographic system; and a choice of newly formulated long barrel objectives, stands and modules that is second to none. And all of this, a breakthrough in cost-effectiveness.

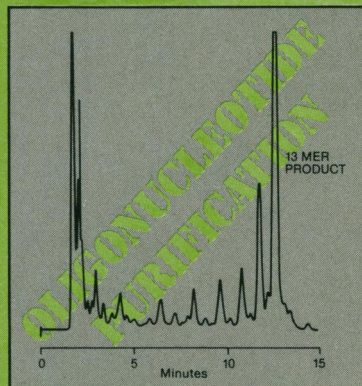
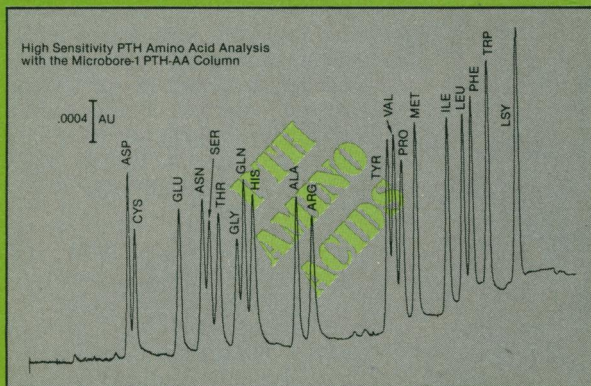
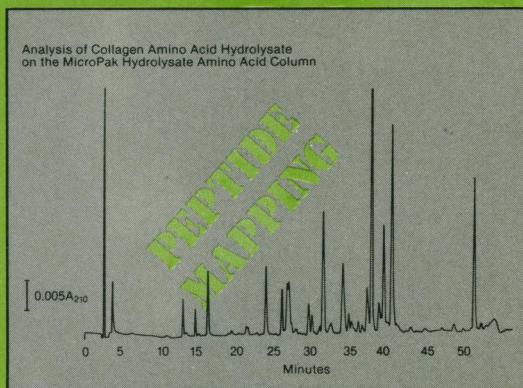
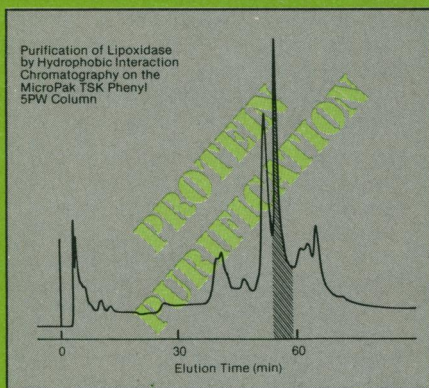
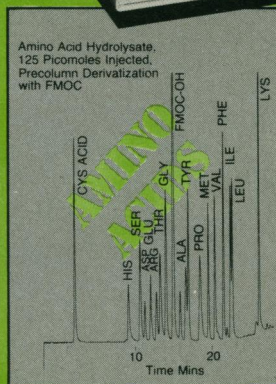
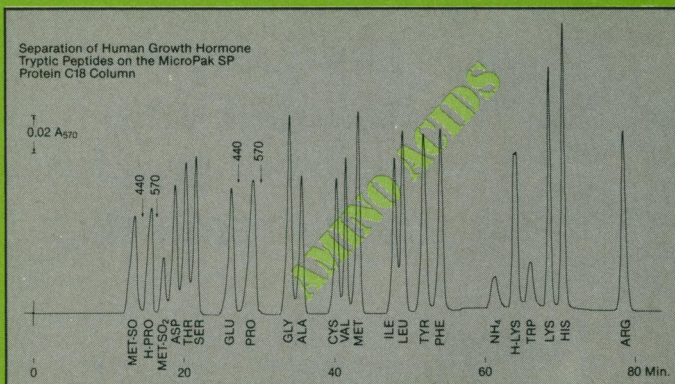
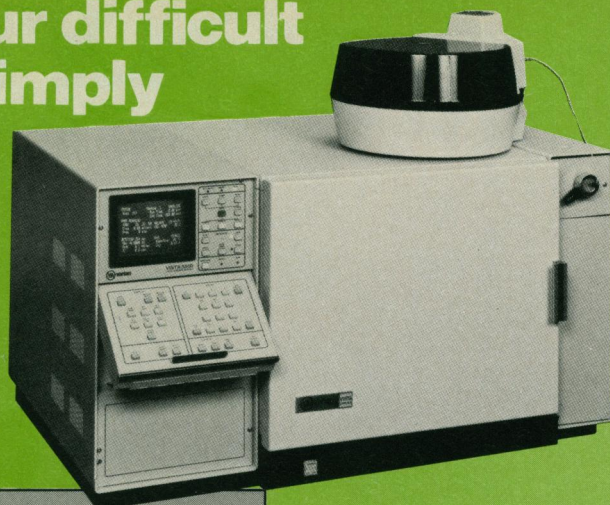
For literature on the incomparable BH-2 System, write Olympus Corporation, Precision Instrument Division, 4 Nevada Drive, Lake Success, NY 11042-1179. Or phone for demonstration: East—(609) 482-1010; Midwest—(913) 648-8323; West—(415) 342-3384. In Canada: W. Carsen Co., Ltd., Ontario.

OLYMPUS®

For a demonstration circle reader service number 19
For information circle reader service number 34

Varian HPLC solves your difficult separation problems simply and economically

Call 800-231-5772 to find out how Varian 5000 and 5500 Series HPLC Systems, Varian 2000 Series HPLC Components/Systems, and MicroPak HPLC Columns can solve your separation problems.



Post-Column Derivatization

- Hydrolysate and physiological fluid analysis
- Ninhydrin and OPA chemistries
- Fully automated systems for dedicated amino acid analysis

Pre-Column Derivatization

- Rapid analysis
- Subpicomole sensitivity
- Stable derivatives
- Simultaneous analysis of primary and secondary amino acids

Protein Purification

- Full spectrum of MicroPak™ TSK size exclusion, ion exchange, reversed phase, and hydrophobic interaction columns for every application

Peptide Mapping

- Best sensitivity with high efficiency columns and state-of-the-art detectors
- Microbore HPLC for sample-limited applications and peptide concentration

Oligonucleotide Purification

- Rapid, high-resolution separation of deprotected oligonucleotides on the MicroPak SP-oligonucleotide column

PTH Amino Acid Analysis

- Rapid resolution on MicroPak PTH-AA Columns
- Subpicomole sensitivity with microbore HPLC

Varian Instrument Group, 220 Humboldt Court, Sunnyvale, CA 94089
 • In Canada: 332 Guelph Street, Georgetown, Ontario L7G 4B5
 • In Europe: Steinhäuserstrasse, CH-6300 Zug, Switzerland

Circle No. 69 on Readers' Service Card



*See us at the
Pittsburgh Conference
in New Orleans, Feb. 25-28*

No other laboratory shaker is more accurate
or provides faster results than the

Burrell Wrist-Action[®] Shaker

If you expect fast, accurate results from your laboratory shaker, there's only one shaker that duplicates true wrist-action shaking. The Burrell Wrist-Action Shaker.

Here's why.

The Burrell Wrist-Action Shaker duplicates a hand mixing swirl for as long as necessary, at the speed and shaking angle you select. The swirling motion is the key . . . all the contents are in continuous motion, assuring faster, more complete mixing. The swirling motion is consistent at every speed, so you can replicate exact operations . . . every time.

Flexible and versatile.

Flexibility and versatility are what make the Burrell Wrist-Action Shaker

so popular. We call it the Build-Up[®] System. With it you can add on or interchange side-arms and platforms so the capacity of your Burrell Shaker grows and changes with your needs. The Burrell Shaker can accommodate from four to twenty-four Erlenmeyer flasks, and with special clamps a Burrell platform can hold up to eight 250 ml flasks, as well as separatory funnels as large as 2000 ml.

Who uses the Burrell Wrist-Action Shaker?

The Burrell Shaker is working accurately in hundreds of industrial and clinical laboratories; government research departments; universities, colleges and technical schools. For

more than forty years, the Burrell Shaker has been working hard in laboratories around the world. It's a proven, quality, indispensable piece of laboratory equipment.

Get the whole story.

We want you to know all the facts. Write or call Burrell Corporation and we'll send you our brochure describing the only true wrist-action shaker available.

BURRELL

BURRELL CORPORATION
SCIENTIFIC INSTRUMENTS
AND LABORATORY SUPPLIES
2223 FIFTH AVENUE, PITTSBURGH, PA 15219
Telephone 412/471-2527



ALL THE FEATURES OF THE BURRELL WRIST-ACTION SHAKER ADD UP TO THE MOST VERSATILE SHAKER AVAILABLE.

BURN YOUR REFERENCE CARDS!

REF-11™

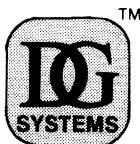
Computerizes your REFERENCES
and prepares your BIBLIOGRAPHIES

- ☐ Maintains a data base of references
- ☐ Searches for any combination of authors, years of publication, reference title (or any words in the title), and topics covered by the reference
- ☐ Formats bibliographies exactly as you want them
- ☐ Alphabetizes references
- ☐ Menu driven dialogue
- ☐ Abbreviates journal titles
- ☐ Compact storage format
- ☐ Runs on any video terminal and printer
- ☐ 20 lines of comments for each reference

IBM PC/XT, MS-DOS, CP/M 80 ... **\$195⁰⁰**

RT-11, TSX-Plus, RSX-11 **\$250⁰⁰**

VAX/VMS (native mode) **\$350⁰⁰**



ANY
MANUAL **\$15⁰⁰**

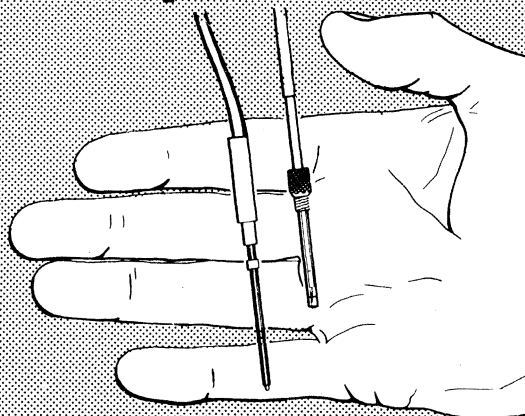
ANY
MANUAL
& DEMO **\$20⁰⁰**

322 Prospect Ave., Hartford, CT 06106
(203) 247-8500

Connecticut residents add 7½% sales tax.

Circle No. 40 on Readers' Service Card

MINIATURE ELECTRODES FOR pH, CO₂, O₂



MICROELECTRODES, INC.

Oak Hill Park, Londonderry, N.H. 03053 USA
(603) 668-0692

Circle No. 47 on Readers' Service Card

You Are Invited to Attend 1500 Life Science Meetings ... *Without Leaving Home*

In 1985, BIOSIS will greatly increase its already extensive coverage of the life science meeting literature — through **BIOLOGICAL ABSTRACTS/RRM® (Reports, Reviews, Meetings)**.

Why? Because meeting papers often provide the first clues to important new research. And, as you've probably already discovered, finding these papers is getting harder and harder.¹

In 1985, we're going to alert you to more than 140,000 papers recently presented at major scientific conferences around the world. Papers important to research awareness. . . papers not reported anywhere else.

We thought you'd like to be the first to know.

For more information about **BA/RRM**, contact BIOSIS User Services Dept., 2100 Arch Street Philadelphia, PA 19103-1399 USA, or call toll free (800) 523-4806 (USA, except AK, HI, PA). (215) 587-4800 worldwide. Telex 831739.

¹If you're a regular reader of *Nature*, you've probably seen the letters in the Correspondence section in the past year on the importance of meeting papers. If you haven't, we'd like to share them with you. Write to BIOSIS User Services for a summary of the dialogue.



Introducing the Syn-Thor™2000 from Peptides International. Excellence compounded.

Excellence in a Solid Phase Peptide Synthesizer.

Recent advancements in the field of peptide synthesis have created the need for a moderately priced but versatile new instrument that can be used to synthesize peptides rapidly and reliably.

That instrument is here today, the new Syn-Thor 2000. It's fast . . . accurate . . . rugged . . . and so easy to use that it will benefit everyone from the novice to the most experienced peptide chemist.

**Introductory price
ends February 28**

Compare these features with any other solid phase synthesizer on the market today:

- A user-friendly, menu driven program
- Over 50 help screens are available to help guide you through any synthesis process
- 10 pre-programmed files are adaptable to any synthetic scale
- Prepares anywhere from 100 mg to 50 grams of peptide
- IBM PC, color graphics monitor and dual disk drive (printer optional)
- Automatic checks maintain desired synthesis process
- All Teflon valves plus nitrogen purging/self-cleaning lines
- Lots of other outstanding features

Special introductory price only \$27,950.

Excellence in peptide related products.

Your work deserves the best reagents possible. That's exactly what Peptides International delivers.

Our protected amino acids and biologically active peptides are produced under the world's strictest quality control standards . . . those of the Protein Research Foundation of Japan.

To secure your supply, just call or send us a purchase order. We'll process it the day we receive it, and, if you want, we'll have your order delivered the very next day.

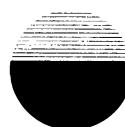
Guaranteed excellence.

All Peptides International products are guaranteed to be of the highest quality on the

market today. If any of our products fail to live up to these standards, return them within 30 days for a full refund.

For a free 1984 catalogue or more information, please call or write to:
Peptides International
P.O. Box 24658
Louisville, Kentucky 40224
USA
(502) 425-8765
Telex: 204110

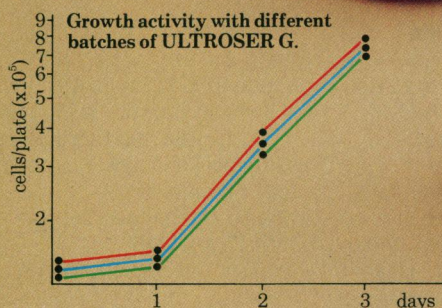
**Peptides International
Excellence Compounded**



Serum free cell growth with new ULTROSER G batch, after batch, after batch

ULTROSER G is a serum free synthetic growth support for multi-purpose cell culture—and cuts out the pretesting needed for fetal calf and other alternatives. As a true serum substitute, its well defined composition guarantees you batch uniformity to consistently give you regular cell development and reliable control over tissue culture variability. You'll soon find out how ULTROSER G saves you time, is easy to use, simple to store and gets you results—batch after batch after batch. With 5 times less protein than FCS to simplify purification and bioassays, and the minimal amounts needed (1–3%), you'll know why so many labs like it even more. And when you discover that it comes lyophilized, ready for use and can be kept outside a freezer, you'll want to check it yourself. Get in touch with LKB, and we'll send you the latest on how to grow cells without serum—and without problems.

Trials performed with Vero cells in HAM'S F12 culture medium supplemented with 2% ULTROSER™ G. Tests carried out by Dr. E. Boschetti at Reactifs IBF, France.



LKB
BROMMA

Head office: LKB-Produkt AB, Box 305, S-161 26 Bromma, Sweden
Tel 08-98 00 40, telex 10492

Main US sales office: LKB Instruments, Inc. 9319 Gaither Road, Gaithersburg, Maryland 20877. Tel. 301-963-3200, telex 909870 (dom.), 64634 (intern.)

UK sales office: LKB Instruments Ltd., 232 Addington Road, S. Croydon, Surrey CR2 8YD, England. Tel 01-657 8822, telex 264414

Other sales offices in: Antwerp, Athens (for Middle East), Bangkok, Copenhagen, Lucerne, Madras, Moscow, Munich, Paris, Rome, Turku, Vienna, Zoetermeer

Developed and
manufactured by
IBF

The care to meet, to know, to understand.

A world-wide scientific
research organization
for human health and
welfare.

A center for promotion of
scientific and cultural activities.

Serono Symposia is an independent
foundation, created in 1971, to promote
scientific research in all disciplines

which contribute towards improving
human health.



ARES
SERONO
SYMPOSIA

This aim is pursued by means
of congresses, courses, seminars
and specialized studies.



Some of the international meetings scheduled for 1985 are:

Herpes and Papilloma Viruses Their Role in the Carcinogenesis of the Lower Genital Tract

Milan, March 11-12

Scientific Organization: G. De Palo (I)
H. Zur Hausen (D)

Recent Advances in Primary and Acquired Immunodeficiencies

Boston, April 10-12

Scientific Organization: F. Aiuti (I)
M.D. Cooper (USA), R.A. Good (USA)
and F. Rosen (USA)

The Interferon System

Rome, May 8-11

Scientific Organization: F. Dianzani (I)
and G.B. Rossi (I)

Drugs and Kidney

Bergamo, May 29-31

Scientific Organization: S. Garattini (I)

Monoclonal Antibodies: Basic Principles, Experimental and Clinical Applications in Endocrinology

Florence, October 2-4

Scientific Organization: M.B. Lipsett (USA)
and M. Serio (I)

Serono Symposia Mini-Courses

The courses, lasting 1 or 2 days, are organized in
collaboration with the Istituto «Mario Negri» for
Pharmacological Research and will be held in
Milan, Italy.

Regulation of Beta-Adrenergic Receptors in Animals and Man.

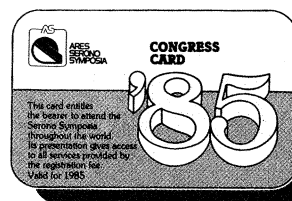
Lecturer: P.B. Molinoff (USA).

Oncogenes and Chemical Carcinogenesis.

Lecturer: M. Barbacid (USA)

Growth Factors as Cell-to-Cell Messages in Atherosclerosis and Inflammation.

Lecturer: R. Ross (USA)



swissair  Official Carrier

Do you know all the
advantages that
the Serono Symposia
Congress Card offers?
Please fill in this form
and mail to
Serono Symposia
for information.

I would like to receive information about:

☐ Serono Symposia Congress Card ☐ All the above Congresses

☐ In particular the Congress on

☐ Mini-Courses

☐ Serono Symposia Publications

Name

Address

Institution

Please send to Serono Symposia, Via Ravenna 8 -
00161 Rome - Italy

SC

OUR WORKSTATION DATA ACQUISITION SYSTEM HAS TOMORROW'S SOLUTIONS BUILT IN.

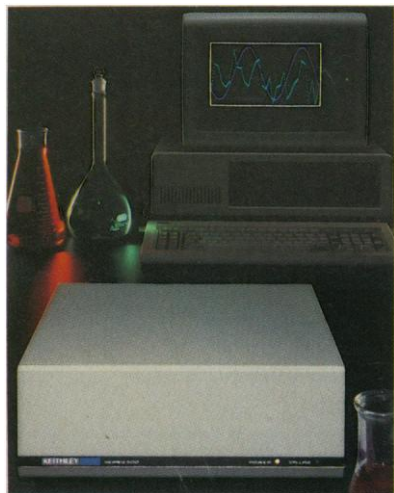
As you conduct your search for the ideal data acquisition system, we think you'll find a number of capable systems, all from fine makers.

But we also think you'll find this: there is really only one system likely to meet, and perhaps exceed, your own personal standards for accuracy, flexibility, performance and power. And do so for a bottom line investment that is truly easy to justify.

That system is the Keithley DAS Series 500 for the IBM PC and Apple II families of micro-computers.

To begin with, even a basic Series 500 configuration, like the one shown in the chart, comes out of its carton with enough power and capacity for most lab and test bench applications. So you needn't trade up to more expensive options to get basic capabilities.

And because the Series 500 is completely modular, you can start out with just the capacity you need. Then choose from our comprehensive library of plug-in function cards to instantly reconfigure your system for the most demanding applications—with up to 272 channels of discrete analog input, 50



**Keithley DAS Series 500
Measurement and Control System.**

	Keithley DAS Series 500	ISAAC 91A	ISAAC 2000	MACSYM 200	HP 3497A
System Base	\$4800 ⁽¹⁾	\$3950	\$4100	\$3660	\$2990
Analog Input					
16 Channels	Yes	Yes	+ \$600	+ \$362 ⁽²⁾	+ \$2104 ⁽³⁾
Instrumentation Amplifier	Yes	+ \$800	+ \$800	Yes	Yes
± 0.035% Absolute System Accuracy	Yes	+ \$1100 ⁽⁴⁾	+ \$1100 ⁽⁴⁾	No	Yes ⁽⁵⁾
30 kHz Sampling	Yes ⁽⁶⁾	No	Yes ⁽⁷⁾	Yes	No
High Speed Programmable Ranges	Yes	No ⁽⁸⁾	No ⁽⁸⁾	Yes	No
Other I/O					
5 12-Bit Voltage Outputs	Yes	+ \$187 ⁽⁹⁾	+ \$937 ⁽¹⁰⁾	+ \$937 ⁽¹⁰⁾	+ \$2500 ⁽¹¹⁾
16 Digital Inputs	Yes	Yes	+ \$175 ⁽¹²⁾	+ \$330	+ \$530
16 Digital Outputs	Yes	Yes	+ \$175 ⁽¹²⁾	+ \$350	+ \$710
4 120VAC Outputs	Yes	No	No	+ \$638 ⁽¹³⁾	+ \$265 ⁽¹⁴⁾
System Features					
Programmable Timers	Yes	Yes	Yes	Yes	+ \$555
Realtime Clock	Yes	Yes	Yes	Yes	Yes
Power Supply	Yes	+ \$350	Yes	Yes	Yes
Software System					
Data Acquisition BASIC	Yes	Yes	Yes	Yes	No
Foreground/Background	Yes	No	Yes ⁽¹⁵⁾	Yes ⁽¹⁵⁾	No
Data Analysis	Yes	No	No	No	No
Realtime Graphing	Yes	Yes	Yes	Yes	No
Engineering Units	Yes	No	No	No	No
Package Price	\$4800	\$6387	\$7887	\$6277	\$9654

1. System 520. 2. 16 channels of \$725 32 channel card. 3. \$1640 A/D card plus 16 channels of \$580 20 channel card. 4. ± 0.003% accuracy @ 200 Hz. 5. ± 0.006% accuracy @ 40Hz. 6. Apple system 27 kHz, IBM system 31.4 kHz. 7. 200 kHz option available + \$3825. 8. Only available with 16-bit A/D converter with programmable gain pre-amplifier + \$1100. 9. 1 channel from \$750 4 channel card. 10. 5 channels from \$750 4 channel card. 11. 5 channels from \$1000 2 channel card. 12. 16 channels of \$350 32 channel card. 13. Price based on 16 channel rack @ \$550 plus 4 AC output relays @ \$22. 14. Four channels of \$525 8 channel card. 15. Or other multi-tasking structure.

channels of analog output, 160 channels of digital I/O, and AC/DC device control. With direct transducer connection and signal conditioning for each individual channel.

It's also the only system equipped with Soft500, the integrated measurement and control software that proves once and for all that easy doesn't have to mean simplistic.

Soft500 gives first time users the accessibility and friendliness they need to get excellent results the first time out. Yet it also provides experienced users with the depth and extended facilities needed for complex applications. Including unique features such as foreground/background architecture, powerful screen graphics and statistical analyses. Plus, automatic conversion of binary data to familiar engineering units.

In all, you'll find the features you need to make the Series 500

increasingly productive through years of new and more demanding applications.

Naturally, we'd like to suggest the Series 500 as the wisest choice in workstation data acquisition. But we also believe that as you compare and examine the facts, the Series 500 will eventually suggest itself.

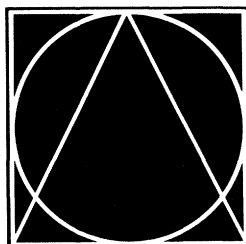
For complete information on the Keithley DAS Series 500 workstation data acquisition system, call us toll-free at 1-800-552-1115. In Massachusetts call (617) 423-7780. Or write to us at Keithley DAS, 349 Congress Street, Boston, Massachusetts 02210.

Series 500



©1984 by Keithley DAS, Boston, Massachusetts

Information contained in the comparison chart is correct to the best of our knowledge as of July 3, 1984; however, Keithley DAS assumes no liability for its accuracy. IBM PC is a registered trademark of International Business Machines Corporation. Apple II is a registered trademark of Apple Computer, Inc. ISAAC is a registered trademark of Cyborg Corporation. MACSYM is a registered trademark of Analog Devices, Inc. HP is a registered trademark of Hewlett-Packard, Inc.



Smith Kline & French Laboratories

Announces

the Third in Its Series of
Annual Research Symposia

Co-Organizers:

George Poste and Stanley T. Crooke

New Insights into Cell and Membrane Transport Processes

March 12-14, 1985

Wyndham Franklin Plaza Hotel
Philadelphia

Tentative Program

M. Berridge	C. Hopkins	L. G. Palmer	G. Sachs
G. Blöbel	H. R. Kaback	R. L. Post	D. J. Triggle
L. C. Cantley	S. Lewis	H. Rasmussen	R. W. Tsien
W. A. Catterall	H. Lodish	J. P. Reeves	I. B. Weinstein
D. D. Fanestil	I. Mellman	T. K. Rink	J. R. Williamson
H. J. Geuze	P. H. Naccache	D. D. Sabatini	S. van Heyningen
J. F. Hoffman	G. K. Ojakian		

For Additional Information and Registration Forms, Contact:

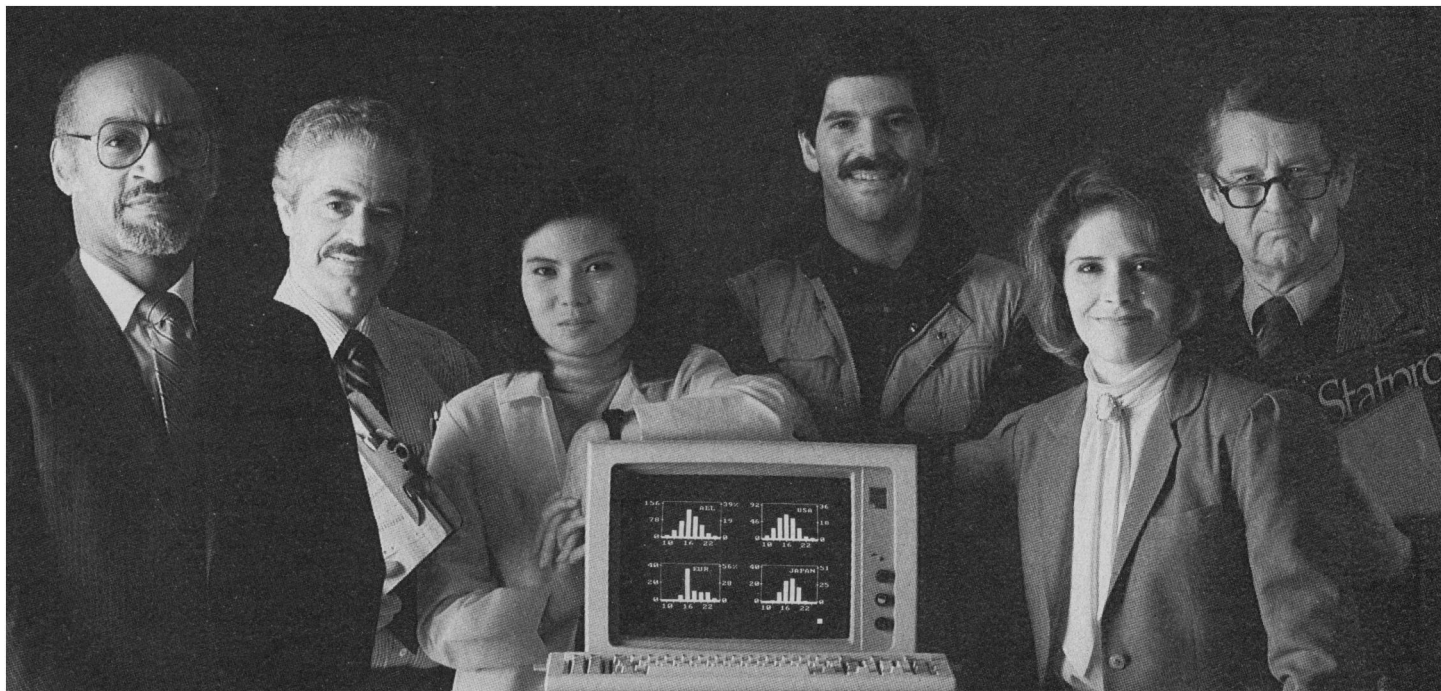
Ms. Buff Biddle
Symposium Coordinator
Post Office Box 7929
Philadelphia, Pa. 19101

○ = continuity of life

△ = quest for knowledge

□ = resolution

(NW60)M



Statpro Professionals.

People who want to spend their time
analyzing results, not just crunching numbers.

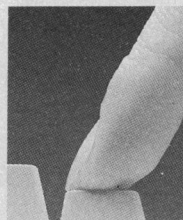
Statpro™ data analysis software was specifically created to give professionals of all kinds the analytical tools they need on the job.

It's for corporate planners and marketing specialists, engineers and lab technicians, scientists and educators. In fact, Statpro is for every professional who does data analysis but can't afford to waste time.

Mainframe statistics on your PC.

As a practical tool for professionals, Statpro was specially designed for the personal computer. It's not a scaled-down mainframe program or one of those packages that can only handle a few basic analyses. Instead, it brings a full repertoire of statistical techniques to your IBM PC or PC/XT. From basic descriptive statistics and linear regressions to unequal size ANOVA and discriminant function analysis.

And despite its impressive power, Statpro is easy to use. You just respond to simple menus and screen prompts with single keystrokes. No programmers,



Single keystrokes are all it takes to put Statpro to work.

complex commands or long lines come between you and the job.

A powerful database.

Because you'll want to set up your analyses according to your needs, we've equipped Statpro with a remarkably flexible database. You can range check, verify data entries and keep track of missing data. Analyze

any subset of your data-

base. Transform variables according to virtually any formula. And add, edit, delete, sort or move data wherever you want.

Chances are you'll also be using data

from other sources. So Statpro is designed to allow you to easily exchange information with other popular programs and file formats, such as 1-2-3,™ dBase II,™ ASCII, DIF™ and SYLK.™

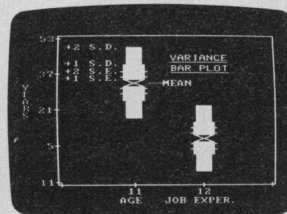
Lots of graphics.

Nothing makes complex data clearer and easier to present than pictures. So Statpro lets you create graphics and charts in the best format for each job, from pie charts, scatter and regression plots to bar, box and

multivariate vector plots. What's more, Statpro graphics can be customized—with scaling, labels and colors—to emphasize important aspects of your analyses.

Call for a demo.

Statpro Professionals get more



Colorful graphics make complex data easy to understand.

done, faster. But don't take our word for it. Call and ask about our demonstration package, or order Statpro for only \$795.

Don't wait! Become a Statpro Professional today.

800-322-2208

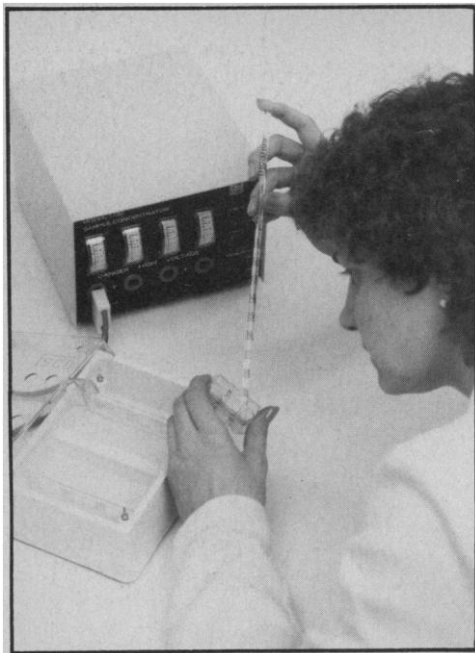
In Massachusetts, call (617) 423-0420.

Call us for the dealer nearest you.

Wadsworth Professional Software

Statpro is a trademark of Wadsworth Professional Software, Inc. dBase II is a registered trademark of Ashton-Tate. DIF is a trademark of Software Arts, Inc. 1-2-3 is a trademark of Lotus Development Corporation. SYLK is a trademark of Microsoft Corp.





RECOVER SAMPLES FROM GELS AND GRADIENTS.

CONCENTRATE SMALL SAMPLES FAST.

Concentrate and separate samples from non-ionic media such as polyacrylamide gels or density gradient sugar solutions. You can use an Isco concentrator for proteins, nucleic acids, certain whole cells and fragments, or any other water soluble macromolecule larger than 3500 MW and having electrophoretic mobility

The Isco concentrator gives you 50-fold concentration of up to sixteen 10 ml samples in 90 minutes or less. To learn more, write or phone toll-free [800]228-4250.



Isco
Box 5347
Lincoln, NE 68505
USA

Circle No. 54 on Readers' Service Card

ful in the treatment of *Pneumocystis carinii* pneumonia in AIDS patients (4).

Although we are especially familiar with DFMO (2, 3, 5), many other viable approaches are being investigated, some in our own laboratories and many others in the laboratories of our colleagues.

CYRUS J. BACCHI
*Haskins Laboratories and Department
of Biology, Pace University,
New York 10038*

ALLEN B. CLARKSON, JR.
*Department of Medical and Molecular
Parasitology, New York University
School of Medicine, New York 10016*

References

1. A. Sjoerdsma and P. T. Schechter, *Clin. Pharmacol. Therapeut.* **35**, 287 (1984).
2. A. B. Clarkson *et al.*, *Am. J. Trop. Med. Hyg.* **33**, 1073 (1984).
3. C. J. Bacchi, H. C. Nathan, S. H. Hutner, P. P. McCann, A. Sjoerdsma, *Science* **210**, 332 (1980).
4. J. A. Golden, A. Sjoerdsma, D. V. Santi, *West. J. Med.* **141**, 613 (1984).
5. A. B. Clarkson *et al.*, *Proc. Nat. Acad. Sci. U.S.A.* **80**, 5729 (1983); P. P. McCann *et al.*, in *Mechanism of Drug Action*, T. P. Singer and R. N. Oudarza, Eds. (Academic Press, New York, 1984), p. 159.

Biological and Chemical Warfare

In R. Jeffrey Smith's article about concerns raised by the Army's proposed new facility for testing aerosols of lethal biological agents (News and Comment, 7 Dec., p. 1176), a number of scientists are quoted as criticizing the project on the basis of its being defensive "overkill" and the likelihood that it will generate information leading directly to the development of offensive biological weapons. No one questions the value of defensive studies *per se*. But a policy of developing defenses against biological and chemical weapons that the Soviet Union might possibly develop entails serious risks. The same policy is sure to be adopted reciprocally by the Soviet Union, leading almost inevitably to a superpower race to develop and perfect increasingly lethal weapons, for, as many scientists have pointed out, biological studies for defensive and offensive purposes are virtually indistinguishable. Many smaller nations also have the capacity to join the race and might do so for both deterrent and protective purposes. Ultimately, some of the perfected weapons could fall into the hands of terrorists. A world bristling with sophisticated biological and chemical weapons will be a good deal less safe than it is now, even if the weapons are not used, as shown by the present dangerous state of our decaying chemical weapons stockpile.

Not to develop defenses against con-

ceivable biological and chemical weapons also entails risks. But if such a policy were clearly avowed and openly maintained, thereby lessening the perceived threat to other nations, those nations might be encouraged in their own self-interest to follow suit, and an international treaty might result. Taking a chance on mutual security in this sphere is considerably less dangerous than preparing for the worst, for no defense against biological or chemical weapons can be fully satisfactory, and the defensive preparations themselves, like "star wars," will make offense more likely.

BARBARA HATCH ROSENBERG
*Molecular Biology and Virology Unit,
Memorial Sloan-Kettering Cancer
Center, New York 10021*

Chemical Information Online

I was pleased to see that *Science* is continuing to present articles regarding the status of the Chemical Information System (CIS), which we used to provide to the public on behalf of the Environmental Protection Agency. I was also pleased to see that Jeffrey L. Fox indicates in his most recent article (News and Comment, 16 Nov., p. 816) that we will now be making the CIS available to the public commercially.

The article states that we will not leave the system "intact." While this is semantically correct, it implies that we will be dismantling the CIS. In fact, we will be adding new databases and system capabilities.

The article also erroneously states that Information Consultants Incorporated will be putting the contents of *The Merck Index* online. Actually, on 28 November the final signatures were placed on a contract between Fein-Marquart Associates and Merck & Company; *The Merck Index Online*—an updated version of the published 10th edition—is now the only public, online access to *The Merck Index*. This and many other new and updated databases will be placed onto the CIS, as provided by our subsidiary, Chemical Information Systems, Inc.

ALVIN E. FEIN
*Fein-Marquart Associates, Inc.,
7215 York Road,
Baltimore, Maryland 21212*

Erratum: In the article "Panel says Depo-Provera not proved safe" (News and Comment, 23 Nov., p. 950), the dosages of Depo-Provera, a progestogen, and estrogens used in cancer therapy and as a contraceptive were incorrectly reported. In cancer therapy, the hormones are used in large doses. In contraceptives, the dosages are small.

NOW. PERMANENT STORAGE OF CELLS AT -135°C .

**SAFELY BELOW THE CRITICAL GLASS
TRANSITION TEMPERATURE OF WATER.**

Evidence proves optimal cell viability and
infinite storage duration below -130°C ¹.

Queue Cryostar preserves cells at
all storage levels. Temperatures
are precisely maintained
with better uniformity
than LN_2 vapor.

Because no LN_2 is
used. So our patented
mechanical refrigeration system offers
greater operational
economy.

-129°C AND ABOVE

- Glass transition temperature not achieved.
- Cell lysis caused by continuing lattice rearrangement.
- Enzyme activity decreased but not suspended.
- Questionable cell viability and storage duration.

-130°C GLASS TRANSITION TEMPERATURE OF WATER.

-131°C AND BELOW

- Glass transition temperature maintained.
- Enzyme activity suspended. Biologically relevant, thermally-driven reactions cannot occur.
- Optimal cell viability and permanent, safe storage duration.

The Queue Cryostar
cryogenic preservation system.
A safe, -135°C temperature that
can keep over 17,000 vials for
generations.

Need proof? For more information, call
toll-free 1-800-252-6500.

Circle No. 70 on Readers' Service Card

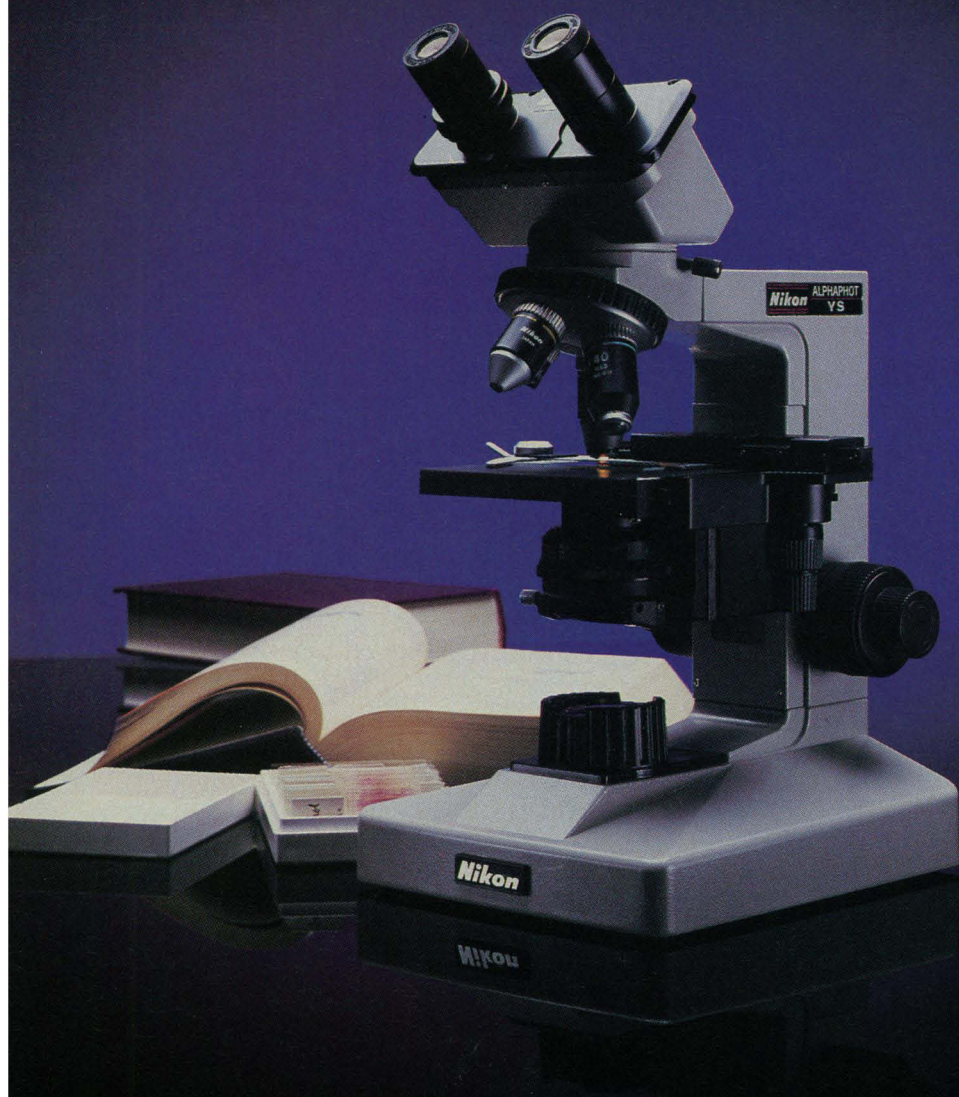
Queue

Queue Systems, Inc., Box 1901, Parkersburg, WV 26102 USA
Toll-Free 1-800-252-6500 WV 304-464-5400 Telex 869424

¹Committee on Germplasm Resources, National Research
Council. 1978. Conservation of Germplasm Resources:
An Imperative. 7:79-84.

NEW FROM NIKON

Professional image...
educational price.



The new Nikon Alphaphot brings to the classroom and laboratory high resolution CF optics, a bright 20W tungsten illuminator and rugged construction. Now you can get long term professional performance and Nikon system capabilities for an incredibly low investment.

With new CF-E Series objectives, the Alphaphot delivers unrivalled color fidelity, sharpness, and flatness of field. And, as part of the Nikon system, the Alphaphot is capable of phase contrast, darkfield, epi-fluorescence and polarized light. In addition, the Alphaphot is available with quartz-halogen Koehler illumination for critical applications and photomicrography.

The Alphaphot is designed with education in mind: rugged alloy stand, built-in stage-stop mechanism, and spring-loaded 40X and 100X objectives protect both microscope and specimen from accidental damage, while locking mechanisms on all optical and mechanical components protect against tampering.

And yet the Alphaphot is surprisingly affordable. It's also backed by a five-year full warranty and a nationwide network of sales and service representatives. See your Nikon dealer today for a demonstration. Or contact Nikon Inc., Instrument Division, 623 Stewart Avenue, Garden City, N.Y. 11530 (516) 222-0200

NIKON ALPHAPHOT

Nikon
Extending Man's Vision

For a demonstration circle reader service number 1
For information circle reader service number 2

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.

Editorial Board

PHILIP W. ANDERSON, DAVID BALTIMORE, ANSLEY J. COALE, J. L. GOLDSTEIN, L. KNOPOFF, SEYMOUR LIPSET, WALTER MASSEY, OLIVER E. NELSON, ALLEN NEWELL, RUTH PATRICK, VERA C. RUBIN, HOWARD E. SIMMONS, SOLOMON H. SNYDER, ROBERT M. SOLOW

Publisher: WILLIAM D. CAREY

Editor: DANIEL E. KOSHLAND, JR.

Deputy Editor for Engineering and Applied Sciences: PHILIP H. ABELSON

Deputy Editor for Physical Sciences: JOHN I. BRAUMAN

Deputy Editor for Social Sciences: GARDNER LINDZEY

Editorial Staff

Managing Editor: PATRICIA A. MORGAN
Assistant Managing Editors: NANCY J. HARTNAGEL, JOHN E. RINGLE

Production Editor: ELLEN E. MURPHY

News Editor: BARBARA J. CULLITON

News and Comment: COLIN NORMAN (deputy editor), JEFFREY L. FOX, CONSTANCE HOLDEN, ELIOT MARSHALL, R. JEFFREY SMITH, MARJORIE SUN, JOHN WALSH

European Correspondent: DAVID DICKSON

Research News: ROGER LEWIN (deputy editor), RICHARD A. KERR, GINA KOLATA, JEAN L. MARX, THOMAS H. MAUGH II, ARTHUR L. ROBINSON, M. MITCHELL WALDROP

Administrative Assistant, News: SCHERRAINE MACK;
Editorial Assistant, News: FANNIE GROOM

Senior Editors: ELEANORE BUTZ, RUTH KULSTAD, MARY PRESCOTT

Associate Editors: MARTHA COLLINS, SYLVIA EBERHART, CAITILIN GORDON, WILLIAM GREAVES, BARBARA JASNY, STEPHEN KEPPEL, EDITH MEYERS, LOIS SCHMITT

Assistant Editor: LISA MCCULLOUGH

Book Reviews: KATHERINE LIVINGSTON, Editor; LINDA HEISERMAN, JANET KEGG

Letters: CHRISTINE GILBERT

Production: JOHN BAKER, HOLLY BISHOP, ELEANOR WARNER; ISABELLA BOULDIN, JEAN ROCKWOOD, SHARON RYAN, BEVERLY SHIELDS

Covers, Reprints, and Permissions: GRAYCE FINGER, Editor; GERALDINE CRUMP, CORRINE HARRIS

Guide to Scientific Instruments: RICHARD G. SOMMER

Editorial Administrator: SUSAN F. ELLIOTT

Administrative Assistant: WILLIAM CARTER

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Telephone: 202-467-4400. For "Information for Contributors" see page xi, *Science*, 21 December 1984.

Business Staff

Chief Business Officer: WILLIAM M. MILLER III
Business Manager: HANS NUSSBAUM

Assistant to the Chief Business Officer: ROSE LOWERY

Membership Recruitment: GWENDOLYN HUDDLE

Member and Subscription Records: ANN RAGLAND

Advertising Representatives

Director: EARL J. SCHERAGO

Production Manager: DONNA RIVERA

Advertising Sales Manager: RICHARD L. CHARLES

Marketing Manager: HERBERT L. BURKLUND

Sales: NEW YORK, N.Y. 10036: Steve Hamburger, 1515 Broadway (212-730-1050); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772); SAN JOSE, CALIF. 95112: Bob Brindley, 310 S. 16 St. (408-998-4690); DORSET, VT. 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581).

ADVERTISING CORRESPONDENCE: Tenth floor, 1515 Broadway, New York 10036 (212-730-1050).

An Editor's Quest (I)

Breathes there the scientist, with soul so dead,
Who never to himself hath said,
"I'd like to publish in *Science*!"
Whose heart hath ne'er within him burned
As specialized journal pages turned
Knowing his latest research has earned
A right to be ranked with the giants?
(With apologies to Sir Walter Scott)

There will of course be some individuals who are born specialists, enjoy being specialists, and are content to live and die as specialists. There are physicists, bombarded by mesons, bosons, monopoles, and quarks, who are not charmed by a world below high energy. There are biochemists, drowning enjoyably in seas of ammonium sulfate and ethidium bromide, who rapidly become saturated when exposed to the lowest concentration of Bessel functions or economic cycles. There are chemists living high on NMR peaks who disdain subjects that cannot be crystallized or lack melting points. There are paleontologists wandering around in the Pliocene epoch, perfectly happy at being millions of years behind the times.

No one in his right mind would wish to interfere with such bliss, particularly in a world fraught with nuclear missiles, stagnant economies, and grant renewals. Nevertheless, there is a function for a journal that brings together the best from all disciplines. For the scientific community it means that those involved in the common enterprise of expanding the frontiers of knowledge will be exposed to discoveries at the cutting edge of another discipline. For the research scientist it has the practical concomitant that inventive minds will often find a way for a technique or concept of one discipline to create a new frontier in a second. Chemists now use the NMR discovered by physicists; archeologists are helped by the carbon dating discovered by chemists; evolutionists use the DNA sequencing discovered by biochemists. The list could go on, but it emphasizes that no science is an island unto itself.

There is a great need for a journal to serve not only the community within its discipline but also the information flow between disciplines. *Science* has reported on and published scholarly articles in the entire spectrum from mathematics to social science, and this new editor would like to carry on that tradition and possibly improve and enlarge it. We will actively solicit those articles that are considered to be breakthroughs within a discipline, even if some of them may be difficult for the nonspecialist.

The first criterion should be excellence; within that criterion, the more general will be favored over the more particular. All things being equal (which they rarely are), an article that is comprehensible to more than one disciplinary group will be favored over one that has a more narrow focus. The more general may not always be the more important, but generality seems an appropriate goal for a multidisciplinary journal, which *Science* has been and, in my opinion, should remain.

To publish the best while providing for interdisciplinary communication, we shall attempt to make the abstracts understandable to the nonspecialist, even though the body of the article is written for the specialist. Thus we shall welcome the first announcement of a laser, a recombinant DNA, a Phillips curve, or an Oldowan chopper, even if the detailed evidence is beyond the general reader.

Next week I shall describe some procedures that are being designed to implement these general goals.—DANIEL E. KOSHLAND, JR.

