12 January 1979 • Vol. 203 • No. 4376 $1.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

For quiet-running, large-capacity centrifuges look to Beckman

J-6B Floor Model

Now better than ever, this unusually quiet 6000-rpm refrigerated centrifuge spins six liters or six blood bags—50% more than most floor models. Its modular Multi-Disc™ adapters are a delight to use, and hold a large number and variety of tubes and bottles. For example, the J-6B can run as many as 336 RIA tubes!

The J-6B features a dependable high-torque DC drive for rapid acceleration/deceleration, and there are 13 fixed-angle and horizontal rotors to choose from.

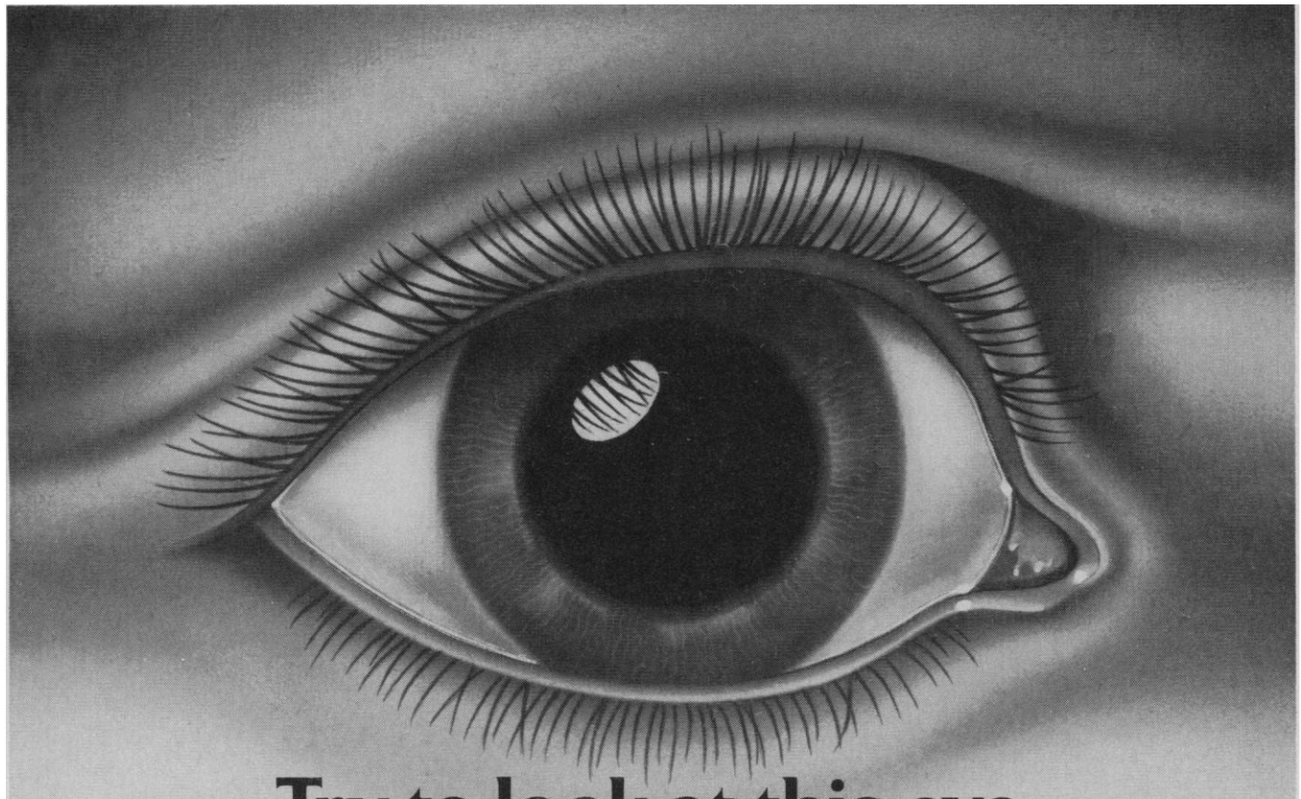
TJ-6 Table Top

This may be the most popular centrifuge ever introduced. It comes with refrigeration or without, and spins a full liter of sample. Maxi-Carrier tube racks hold every popular size tube, and lots of them: up to 120 RIA tubes, for example. The TJ-6 also has a rotor bowl which lifts out for easy cleaning, stainless steel buckets to contain liquid in case of tube breakage, and a rotor imbalance detector.

These two superior centrifuges are what you'd expect from Beckman, the most respected name in centrifugation. For brochures on the J-6B and TJ-6 write to Beckman Instruments, Inc., Spinco Division, 1117 California Ave., Palo Alto, CA 94304. Ask for SB-480/490.

BECKMAN®

Circle No. 38 on Readers' Service Card



Try to look at this eye without moving yours.

The fact is, you can't do it.

Even in a fixed stare, your eyes are constantly on the move, darting back and forth in two dimensions. Activated by discrete nerve impulses, this micro-motion would make you feel seasick but for the role of perception in smoothing out the tiny, quick jumps.

Now you can explore this fascinating quantum world within the eye in the January issue of SCIENTIFIC AMERICAN.

You'll also discover how photons do the work of electrons in new communications technologies. Fiber optics will serve as "conductors" with their own peculiar electro-magnetic behavior. (Do you know why glass is transparent?)

Just as glass fiber is more than a "light pipe," so a cell membrane is more than a container. This month's issue delves into the working functions of this membrane by examining its structure in detail.

From other articles, you'll learn what lets the sperm whale dive longer and deeper than any other air-breathing animal. And why the continental drift theory holds true despite the recent discovery of continental "roots" penetrating far into the earth's mantle. Even how a piano manages to sound in tune when its individual strings are tuned out of tune.

This is the kind of wide-ranging diversity our regular readers enjoy every month. SCIENTIFIC AMERICAN keeps people abreast of the major advances in science that have made the past three decades the most momentous in intellectual history.

These important developments have been reported in our pages by the scientists (including 65 Nobel prize-winners) who actually did the work. The collaboration of our editors in the preparation of text and illustration makes this work accessible to a world-wide readership.

So join our more than 675,000 regular readers by using the coupon. As soon as your subscription payment is received we'll send you a free bonus book: Cosmology + 1 (124 pages, regular price $5.50), an anthology that explores radio galaxies, black holes and other splendors of the cosmos.

There's no need to send payment with your order. We'll bill you later. But subscribe now, so you can keep a close watch on the scientific advances that are changing the world before your very eyes.

SCIENTIFIC AMERICAN

SUBSCRIPTION RESERVATION
SCIENTIFIC AMERICAN
415 Madison Ave., Dept. WZ
New York, N.Y. 10017

Please enter my subscription to the monthly issues of SCIENTIFIC AMERICAN for the term I have checked. I understand that you will also send me – absolutely free – the 124-page book Cosmology + 1 (regular price: $5.50), as soon as my payment is received.

YOUR GUARANTEE
You may cancel your subscription to SCIENTIFIC AMERICAN at any time and receive a refund for the balance of your subscription. The bonus book is yours to keep.

Name

Address

City/State/Zip

☐ 1 year – $18 ☐ 2 years – $33 (save $3) ☐ 3 years – $45 (save $9)

☐ My payment is enclosed ☐ Bill me

(Subscription rates outside U.S. and Canada:)
(1 year – $22 2 years – $40 3 years – $55)

WZ

ISSN 0036-8075

12 January 1979

Volume 203, No. 4376

SCIENCE

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®**. Domestic individual membership and subscripion (51 issues): $31. Domestic institutional subscription (51 issues): $65. Foreign postage extra: Canada $12, other (surface mail) $15, air-surface via Amsterdam $35. First class, airmail, school-year, and student rates on request. Single copies $1.50 ($2 by mail); back issues $2.50 ($3 by mail); classroom rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. **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

COVER

Atlantic Ocean. Changes over the past 150,000 years in the benthic foraminiferal faunas in a piston core from the North Atlantic occurred in response to the deep-sea circulation. See page 168. [National Oceanic and Atmospheric Administration, Washington, D.C.]

PICK OUR ORANGES FOR FRESHNESS

When it comes to disposable pipets there's more than one way to peel an orange, from CORNING.

A BAG OF ORANGES
New rip-away bag eliminates scissoring.
Pinhole-free polyethylene
with minimum two-inch foldover
allows taping shut.
Can wipe down bag with alcohol.
New bag will not stick.
Cat. no. 7078, sterile, plugged.

The best pipet you can afford to toss away comes in orange wrappers and sacks and shelf packs. This is a genuine PYREX® pipet. **It is glass.** Chemically inert borosilicate glass. It will limit pH shift. It reduces leaching. It will not dissolve in organic solvents. It can be flamed. It is one piece. It will not leak. It will not bend. It will not warp. It has excellent optical qualities. It has a fire-polished tip and mouthpiece. Both are free of burrs. It can be used with common pipet aids. It has baked graduations and markings. Its graduations are acetone and alcohol proof. Its markings are big and easy to read. Its plug is stable. It costs about the same as plastic.

PEEL AN ORANGE
Try our new, improved,
individually wrapped
disposable PYREX pipets.
New split-end opening for easy peel.
Heavier paper eliminates punctures.
Large wrinkle-free wrapper
forms sterile seals.
Wider opening makes it easier to
access pipet without
contaminating tip.
Cat. no. 7077, sterile, plugged.

CORNING

BOXES OF FRESH ORANGES
Our new orange boxes are sturdy and provide greatly improved strength during shipping and storage. They come clean, store easy. All boxes are date coded. Catalog number and size information help identify the pipet you want. Your dealer is stocked with fresh disposable PYREX pipets. Just order: Cat. no. 7077, individually wrapped. Cat. no. 7078, sterile bags as shown. Cat. no. 7079, nonsterile bags and shelf packs.

Circle No. 42 on Readers' Service Card

SHELF-PACKED ORANGES
Our nonsterile, nonplugged disposable PYREX pipets, Cat. no. 7079, now come in new easy-to-store shelf packs. Inside the shelf pack, they're multi-packed in neat, **easy-to-handle** bags. All shelf packs are date coded. And size information is clearly marked. Cat. no. 7079, nonsterile, nonplugged.

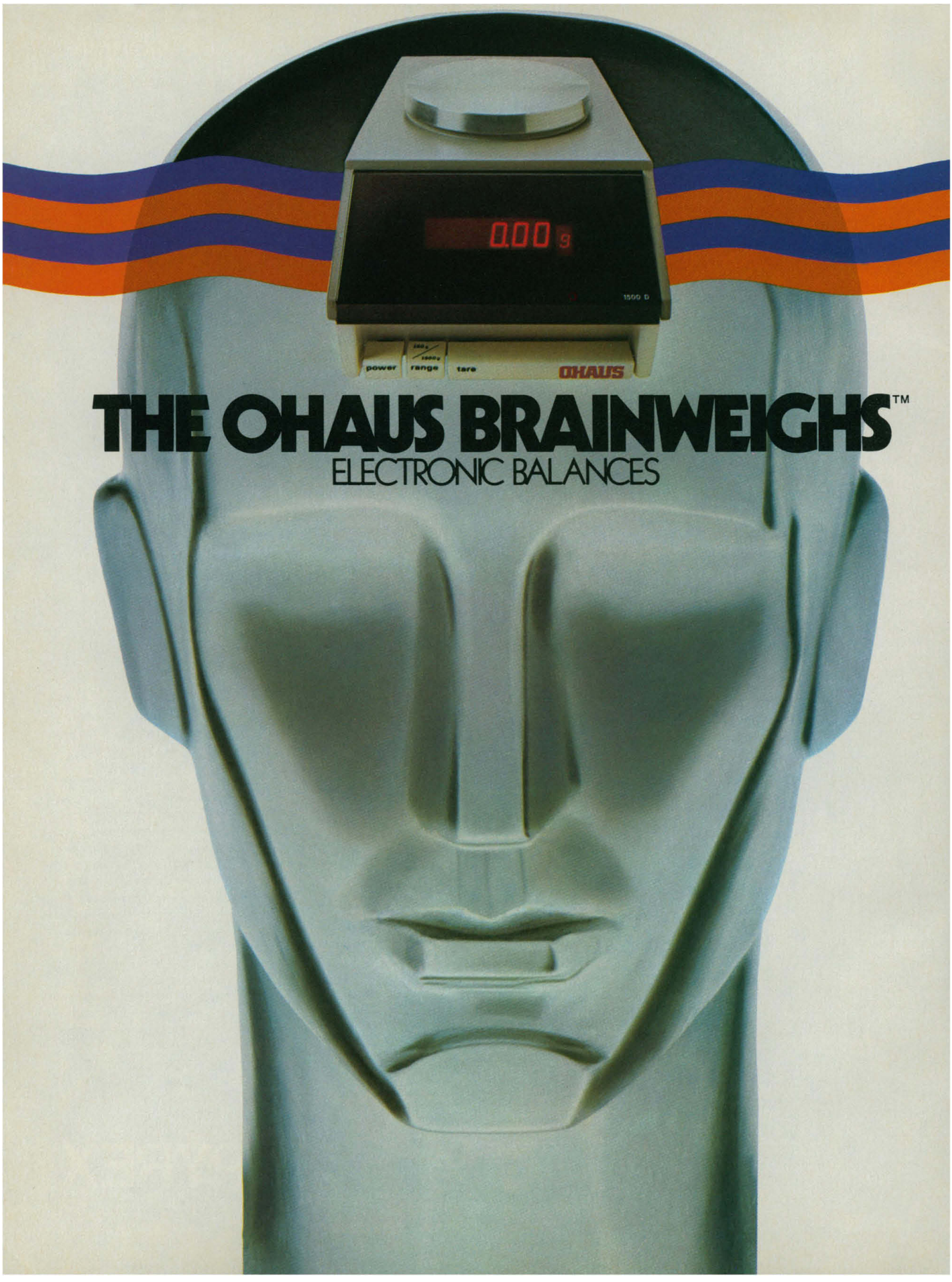
JUICY OFFER

TOTAL VALUE
We try diligently to see that you get the total of Corning's many capabilities in every product we make. We know that's how we earn your trust and retain your business. We know that you would never settle for less than total value from Corning.

SE-A-1
PICK ONE
You get your choice of two free special sample boxes of PYREX disposable pipets.
☐ Sample box of sterile, plugged pipets. ☐ Sample box of nonsterile, nonplugged pipets. We'll also send you a new catalog on PYREX Orangeware products. Just clip this coupon and attach it to your letterhead.

Corning Glass Works, Science Products Division, Mail Station 18, ATTN: LOC, Corning, NY 14830

PYREX®
orangeware



THE OHAUS BRAINWEIGHS™

ELECTRONIC BALANCES

A BRIGHTER BALANCE AT A SMARTER PRICE.

Space-age computer science brings you the weigh of the future.

The new Ohaus electronic balances that use their brains to do your weighing.

Designed to end the myth that high-quality electronic balances are priced beyond your budget.

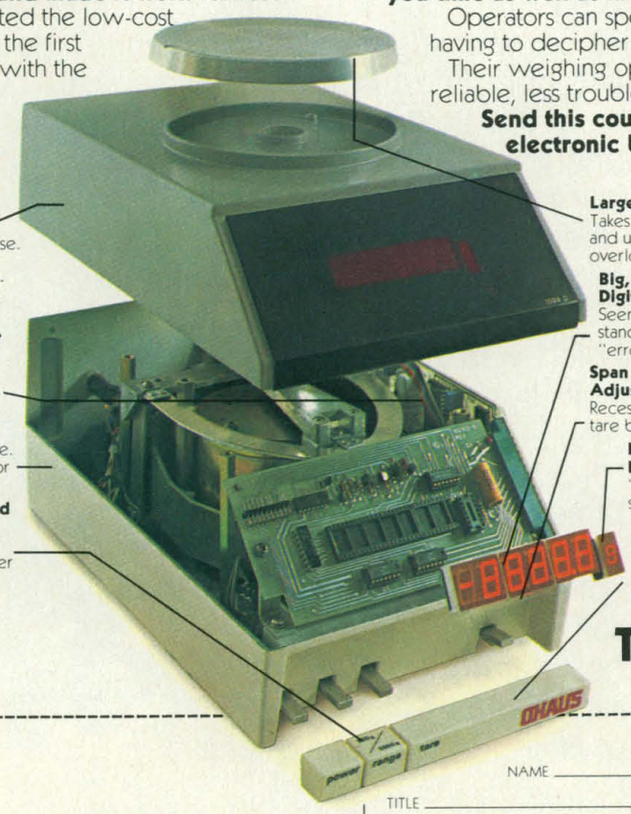
Ohaus saw the future, and made it work for less.

The people who perfected the low-cost mechanical balance have built the first affordable electronic balance with the quality you demand, starting at just $1,195.

The brain behind it all.

Observe the tiny genius that controls every Ohaus electronic balance—our sophisticated microprocessor which stores operator commands, then responds **only** after achieving a stable condition.

That means human interaction without human error.



Die-Cast Construction
Stands up to abuse. Stain resistant. Wipes clean. Protects against dust and spills.

Microprocessor "Brain"
Fewer components for greater reliability.

Compact Size
Ideal for lab table. Sturdy enough for production line.

Clearly Labelled Controls
Right up front for quicker and easier operation.

Large, Stable Platform
Takes variety of objects and unexpected overloads in stride.

Big, Easy to Read Digits
Seen when seated or standing. If overloaded, "error" shows.

Span Calibration Adjustment
Recessed above tare bar.

Rock-Steady Display
"g" lights up for stable reading.

"Rapidtouch" Tare Bar
Recessed to avoid accidentally taring.

Ohaus electronic balances are the simple, easy weigh.

To see how simple and easy they are, consider all the intelligent features Ohaus squeezed into each one.

And you can learn to operate one in just a few minutes.

The Ohaus Brainweighs are so smart, they'll save you time as well as money.

Operators can speed up repetitive weighings by not having to decipher numbers or wait for stable readouts.

Their weighing operations will be faster, simpler, more reliable, less troublesome and a lot less expensive.

Send this coupon to see the Ohaus electronic balances for yourself.

You'll receive our full color catalog showing all the Ohaus Brainweighs. Fully guaranteed. And backed by over 70 years of Ohaus quality engineering.

There's just no other weigh to enter the new world of space-age measurement on a down-to-earth budget.

The Ohaus Brainweighs

The weigh of the future.

OHAUS

Ohaus Scale Corporation, Dept. 14-019
29 Hanover Road, Florham Park, N.J. 07932, (201) 377-9000

☐ Yes, show me the weigh of the future. Send me the full-color catalog on the Ohaus Brainweighs.

☐ I'm ready to see a demonstration. Please have a dealer salesman contact me.

NAME _____

TITLE _____

ORGANIZATION _____

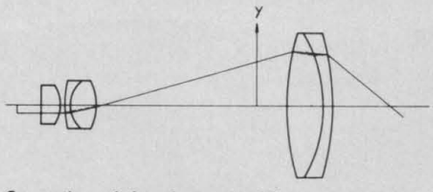
CITY _____

STATE _____ ZIP _____

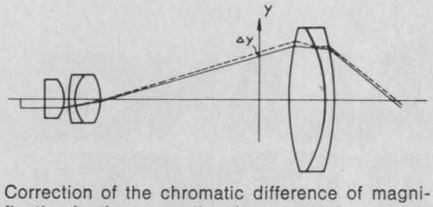
PHONE NUMBER (Area Code) _____

Circle No. 32 on Readers' Service Card

Nikon CF Optics



Correction of the chromatic difference of magnification by the new Nikon CF system.



Correction of the chromatic difference of magnification by the conventional compensation system.

The 20th century's most brilliant advance in lens design

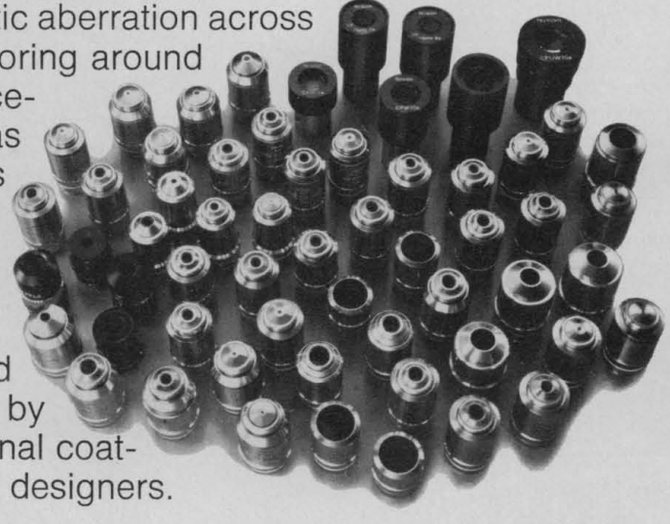
Most developments in 20th century microscopy have been in the mechanical design of the microscope itself and in systems for illumination, photomicrography, and contrast techniques. Today, Nikon announces a major breakthrough in microscope optical design—the Nikon CF Optical System—the culmination of a decade of research.

Nikon's new CF optical system delivers resolution, color fidelity and image brightness unsurpassed by any other light microscope available today. A wide range of CF optics are on Nikon's totally new microscope line now being introduced. Research instruments, clinical instruments, industrial instruments, teaching instruments.

No single page can completely describe the principles of Nikon CF optics. A review of their most important features follows. For a complete description ask Nikon Incorporated, Instrument Division, for its CF optics brochure or read the article on CF optics in the April, 1978 issue of *American Laboratory* magazine.

CF Optics Story. For the past one hundred years, the standard design for microscope optics has been a compensation system in which the eyepiece was designed to offset chromatic aberration in the objective. This system usually performed well in the center of the field of view but exhibited increasing chromatic aberration near the periphery.

In Nikon's revolutionary new CF optical system, chromatic aberration has been corrected in both the objectives and the eyepieces *independently.* The result is a dramatic reduction of chromatic aberration across the entire field of view. The orange coloring around the fringe of the field which was noticeable in the compensation system has been virtually eliminated. Eyepieces used with a photo mask or a reticle exhibit no color fringing. Objectives and eyepieces can be used independently for the best performance of each.



CF optics are the result of advanced computer technology, the total control by Nikon of its optical glass from sand to final coating, and the innovation of Nikon optical designers.

For more information on Nikon CF optics, contact Nikon Incorporated, Instrument Division, a subsidiary of Ehrenreich Photo-Optical Industries, Inc., 623 Stewart Avenue, Garden City, N.Y. 11530; (516) 222-0200.

Look to *Nikon*
ニコンとご用命下さい
Blicken Sie auf Nikon

Circle No. 1 on Readers' Service Card

GCA
CORPORATION

FREE TEST KIT AND 30 DAYS

Let us send you a factory-fresh McPherson 700 spectrophotometer to use in your lab on your work for 30 days.

We want you to have the time for a really objective appraisal, the kind just not possible from a quick look at a salesman's demonstrator.

With your 700, you will also receive a kit. Complete instructions, plus a TI SR-40 calculator, a notepad and diary, as well as a Cross pen and pencil to document your findings.

After 30 days, you either buy the 700 or tell us to come and get it. In any event, you keep the test kit.

Call (617) 263-7733, and we'll configure your McPherson 700 with the functions you need. Wavelength scanning, gel scanning, kinetics, stopped-flow, automatic sampling, even computer capability.

Or for more information, write GCA/Precision Scientific Group, 530 Main St., Acton, Mass. 01720. Offer expires Sept. 30, 1979.

McPHERSON™

DOES IT WITH PRECISION

Circle No. 143 on Readers' Service Card

Houston Tapes

Annual Meeting
HOUSTON
3-8 January 1979

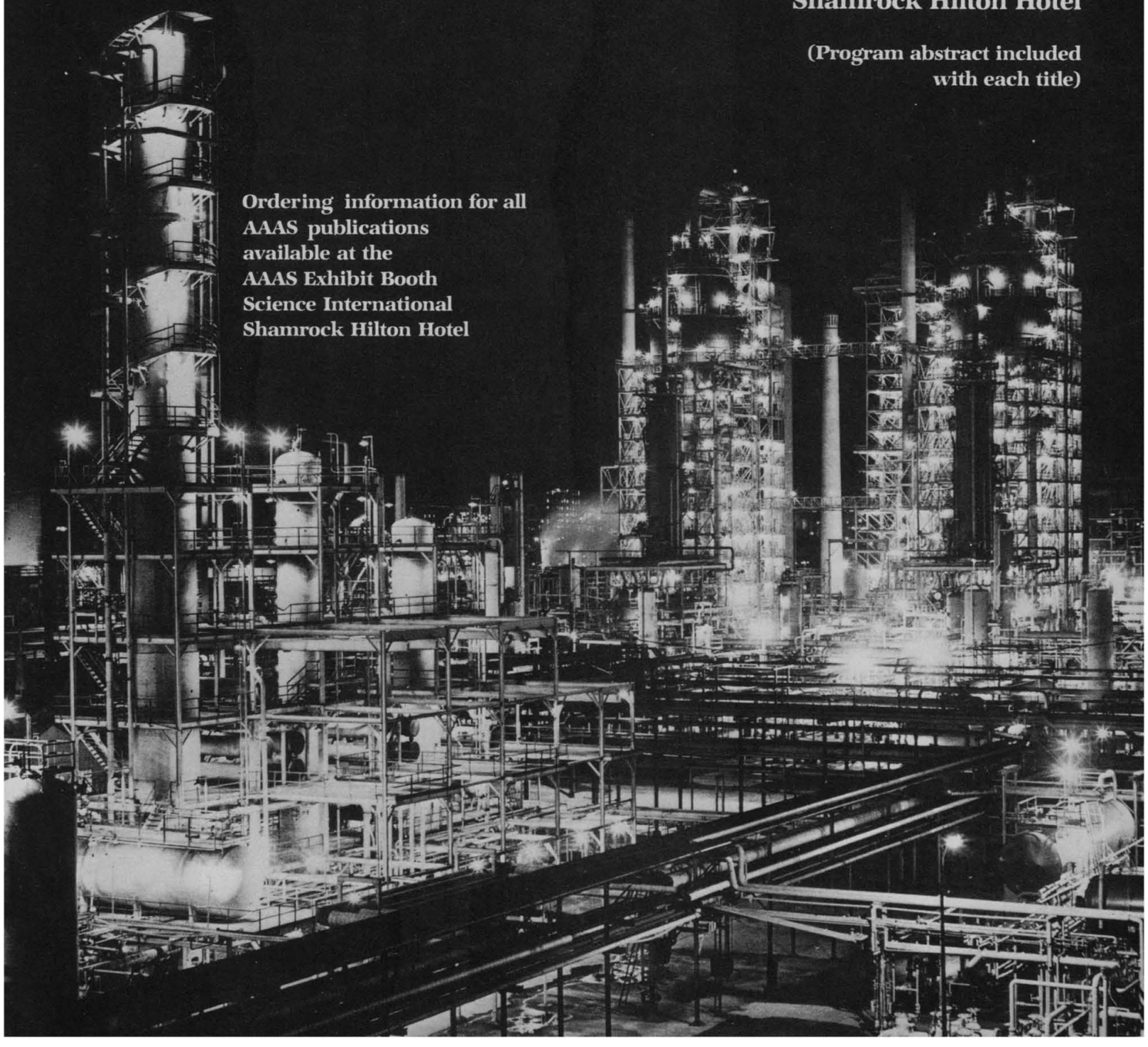
aaas

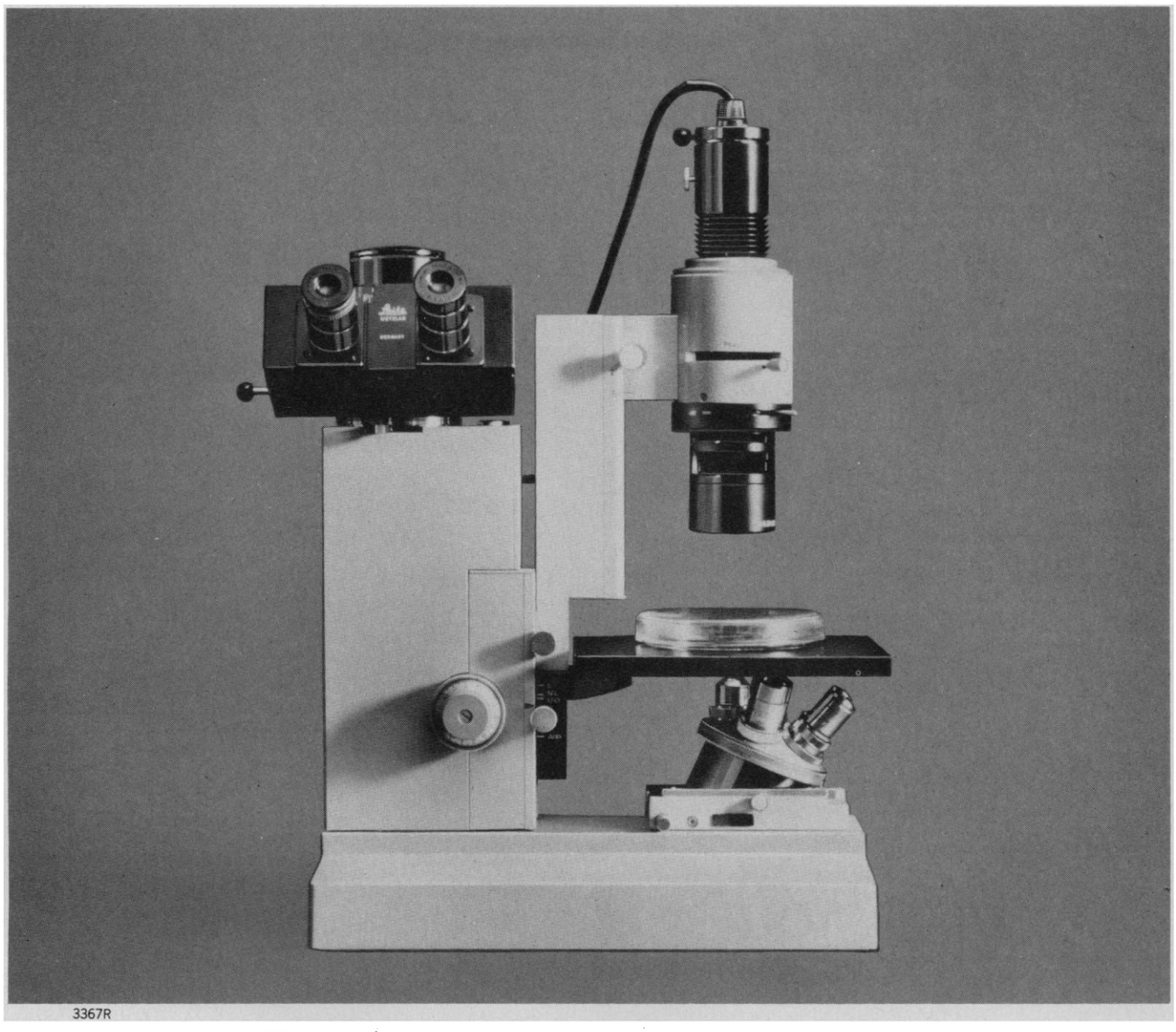
For a list of those sessions taped at this year's Annual Meeting, visit the

CEBAR Sales Desk
AAAS Registration Area
Shamrock Hilton Hotel

(Program abstract included with each title)

Ordering information for all AAAS publications available at the AAAS Exhibit Booth Science International Shamrock Hilton Hotel





3367R

The first inverted microscope designed as an inverted microscope.

The new Leitz Diavert® was engineered from the base up to meet the special requirements of inverted microscopy. It is exceptionally stable with a large rectangular base area. The stand will support large or small vessels and photomicrographic equipment, including the Leitz Orthomat® fully automatic camera and the Leicina® Super 8 movie camera for time lapse studies.

The large object stage is positioned low so you can see what you are doing while manipulating the specimen.

The image moves in the same direction as the specimen. Reason: image-erecting optics. The transmitted light source moves with the stage so it doesn't have to be refocused when you change the specimen plane.

Special long-working-distance, brightfield as well as phase objectives, and also long-working-distance condensers (up to 64mm) are important features.

The Diavert is a building block system so you can readily employ all the techniques of light microscopy, including new interference contrast and incident fluorescence accessories. If you own a Leitz Ortholux II research microscope, you can interchange all Ortholux accessories.

For information call 201-767-1100 or write E. Leitz, Inc., Dept. SC11, Rockleigh, N.J. 07647.

Leitz®

Where most new developments start.

Circle No. 93 on Readers' Service Card

One Idea Leads To Another...

We Lead You To The Ideas

Today's scientist owes much to thinkers of the past. . .and to the work of contemporary researchers in many fields. New ideas often come from the combined effort of many minds, and Chemical Abstracts Service (CAS) is an important part of this combined effort.

CAS, since 1907, has contributed to the progress of science by reviewing the world's chemical literature and making it accessible in the form of abstracts, indexes, and bibliographic information. More than 8,000,000 documents important to chemistry-related sciences are now referenced in the CAS Information System.

In addition to CHEMICAL ABSTRACTS, the weekly periodical known to scientists everywhere, many related information tools in print, microform, and computer-readable files are produced by CAS. As new scientific and technical information is published, CAS will continue to develop increasingly thorough, reliable, and convenient information services.

Our purpose at CAS is to provide the individual researcher with a link to the collective knowledge of the worldwide scientific community. Not only chemists and chemical engineers, but also researchers in biology, medicine, ecology and many other chemistry-related fields can benefit from the CAS Information System.

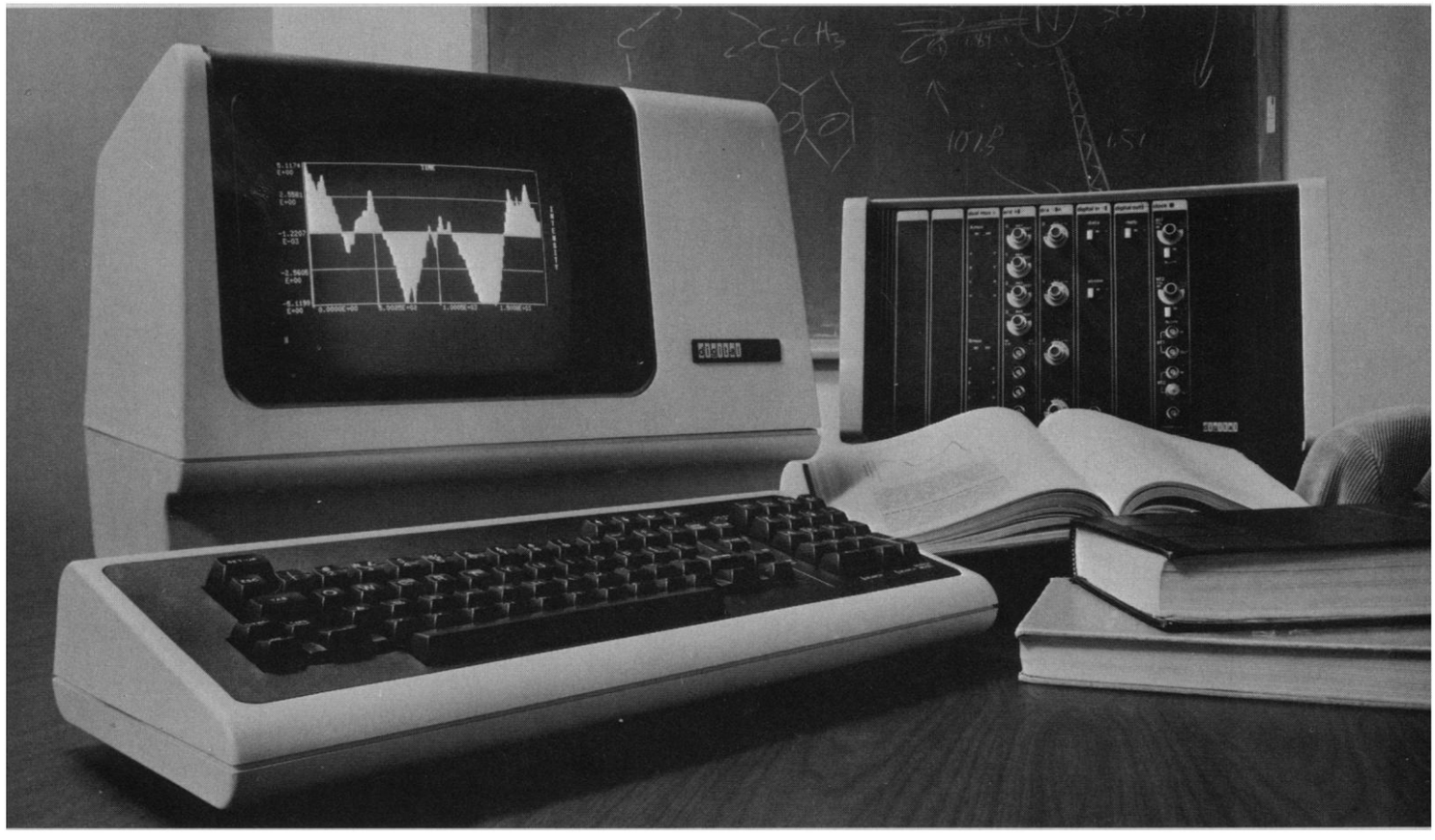
If you agree that keeping up with current research is vitally important . . . we'll gladly tell you more about services available from CAS.

Chemical Abstracts Service
P. O. Box 3012
Columbus, Ohio 43210

A division of the American Chemical Society

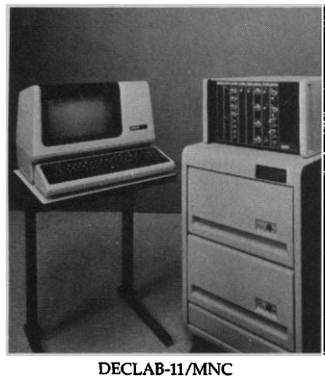
Circle No. 33 on Readers' Service Card

THINK MINC.

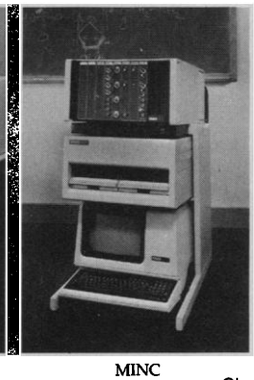


Digital made the computer easy-to-use and easy-to-interface. And you can buy it on a desk-top calculator budget.

Plug MINC in, turn it on, and you can plot charts, solve complex engineering and statistical problems, control instruments and acquire data. You have complete, ready-to-run BASIC software—true computer functionality. It's as easy as that. MINC's built around Digital's proven PDP-11 microcomputer. MINC has its own graphics terminal, one million character dual floppies and three serial line interfaces.



DECLAB-11/MNC



MINC

And MINC makes interfacing easy. Hooking up a lab instrument is as simple as plugging in a single connector to the IEEE Bus interface or one of the seven optional input/output modules. When you finish your experiment, you unplug the connector and wheel the MINC cart to the next job.

And, if you need more on-line data storage, there's the new DECLAB-11/MNC that combines the functionality and ease-of-use of MINC with 10 million character, random access disk drives, powerful FORTRAN software and Digital's versatile RT-11 operating system.

If you'd like the whole story on these easy-to-use systems, write Laboratory Data Products Group, Digital Equipment Corporation, Marlborough, Massachusetts 01752. Telephone (617) 481-9511, Ext. 6969. European headquarters: 12, av. des Morgines, 1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

digital

Circle No. 91 on Readers' Service Card

RECOMBINANT DNA Science, Ethics, and Politics

Edited by JOHN RICHARDS

CONTENTS: SCIENCE. *S. R. Kushner*, The Development and Utilization of Recombinant DNA Technology. *R. C. Valentine*, Genetic Engineering in Agriculture: Biological Nitrogen Fixation as a Case History. *R. Novick*, The Dangers of Unrestricted Research: The Case of Recombinant DNA. *M. Ruse*, The Dangers of Unrestricted Research: A Response to Novick. *S. B. Formal*, The Pathogenicity of *Escherichia Coli*. ETHICS. *D. Callahan*, Ethical Prerequisites for Examining Biological Research: The Case of Recombinant DNA. *R. Curtiss, III*: Comments on Callahan. *J. Richards*, The Limitations of Broad Moral Policies. *M. B. Williams*, Ethical Theories Underlying the Recombinant DNA Controversy. POLITICS. *H. Green*, A Legal Perspective on Recombinant DNA Research. *S. G. Hadden*, Regulation of Recombinant DNA Research. *T. L. Beauchamp*, Should Recombinant DNA Research be Regulated. *D. Clem*, Regulation at Cambridge. BEYOND RECOMBINANT DNA. *H. Jonas*, Straddling the Boundaries of Theory and Practice: Recombinant DNA Research as a Case of Action in the Process of Inquiry. *B. K. Zimmerman*, Beyond Recombinant DNA—Two Views of the Future.

1978, 384 pp., $19.50 ISBN: 0-12-587480-X

SCIENCE AND TECHNOLOGY OF RUBBER

Under the auspices of the RUBBER DIVISION OF THE AMERICAN CHEMICAL SOCIETY

Edited by FREDERICK R. EIRICH

CONTENTS: *A. N. Gent*, Rubber Elasticity: Basic Concepts and Behavior. *M. Morton*, Polymerization. *G. Ver Strate*, Structure Characterization in the Science and Technology of Elastomers. *M. Shen*, The Molecular and Phenomenological Basis of Rubberlike Elasticity. *O. Kramer and J. D. Ferry*, Dynamic Mechanical Properties. *J. L. White*, Rheological Behavior of Unvulcanized Rubber. *A. Y. Coran*, Vulcanization. *G. Kraus*, Reinforcement of Elastomers by Particulate Fillers. *M. L. Studebaker and J. R. Beatty*, The Rubber Compound and Its Composition. *A. N. Gent*, Strength of Elastomers. *R. J. Ceresa*, The Chemical Modification of Polymers. *P. J. Cornish*, Elastomer Blends. *J. C. West and S. L. Cooper*, Thermoplastic Elastomers. *F. Kovac*, Tire Manufacture and Engineering.

1978, in preparation ISBN: 0-12-234360-3

FISH PHYSIOLOGY VOLUME 7: LOCOMOTION

Edited by W. S. HOAR and D. J. RANDALL

CONTENTS: *C. C. Lindsey*, Form, Function, and Locomotory Habits in Fish. *F. W. H. Beamish*, Swimming Capacity. *P. W. Webb*, Hydrodynamics: Nonscombroid Fish. *J. J. Magnuson*, Locomotion by Scombrid Fishes: Hydromechanics, Morphology, and Behavior. *E. D. Stevens and W. H. Neill*, Body Temperature Relations of Tunas, Especially Skipjack. *Q. Bone*, Locomotor Muscle. *D. R. Jones and D. J. Randall*, The Respiratory and Circulatory Systems during Exercise. *W. R. Driedzic and P. W. Hochachka*, Metabolism in Fish during Exercise.

1978, 592 pp., $47.50 ISBN: 0-12-350407-4

Subscription Price: $40.00

VOLUME 8: BIOENERGETICS AND GROWTH

Edited by W. S. HOAR, D. J. RANDALL and J. R. BRETT

Volume 8 of this treatise was written by authorities in the fields of fish nutrition, feeding, digestion, metabolism, bioenergetics, genetics, and growth. A broad, up-to-date treatment of the biochemistry of physiology of these topics, the volume will be of particular interest to fish culturists, whether concerned with research or working in the applied fields of aquaculture and the production of fish for market. The volume will also be of great interest to fish biologists, physiologists, biochemists, and nutritionists. The contributors are research scientists familiar with the practical problems of fish farming and have given these problems appropriate emphasis.

1978, 672 pp., $65.00 ISBN: 0-12-350448-2

Subscription Price: $55.00

TOXICOLOGY AS A PREDICTIVE SCIENCE

PROCEEDINGS OF THE FIRST INTERNATIONAL CONGRESS ON TOXICOLOGY

Edited by GABRIEL L. PLAA and W. A. M. DUNCAN

SECTION HEADINGS: Introduction. Status and Problems in Toxicology. Inter-Species and High-Dose Low-Dose Extrapolations. A. Rationale for High-Dose Exposures. B. Consideration of Experimental Thresholds. Linking Experimental Toxicology and Epidemiology. A. Drugs. B. Environment. Toxicology in Transition. Platform Presentations. Poster Presentations.

1978, 688 pp., $32.00 ISBN: 0-12-558050-9

Special registrant's price: $27.00

LONDON PAPERS IN REGIONAL SCIENCE 8

THEORY AND METHOD IN URBAN AND REGIONAL ANALYSIS

Edited by P. W. J. BATEY

This volume contains a selection of the papers presented at the ninth Annual Conference of the British Section of the Regional Science Association, held in London on September 2nd and 3rd, 1976. Each of these papers is concerned to some extent with the analysis of urban and regional phenomena, and the papers have been grouped into two sections. Regional science theory is the focus for papers in the first section. Apart from describing interesting new developments in well-established areas of theory, this section also contains papers where a more unconventional approach to analysis is adopted. The first section is rounded-off with a critical examination of the relationship between theory and practice in regional science. This paper provides a useful context for the second section of papers, all of which are concerned with the application of regional science methods in policymaking. Of special interest in this volume are three papers that have emerged from the British Section recently formed Workshops. These Workshops, on Regional Science Theory, Spatial Representation, and Regional Science Methods, reflect the healthy range of activity in current British regional science.

1978, 184 pp., $10.00 ISBN: 0-12-081750-0

Send payment with order and save postage and handling charge.

Prices are subject to change without notice.

ACADEMIC PRESS, INC.

A Subsidiary of Harcourt Brace Jovanovich, Publishers

111 FIFTH AVENUE, NEW YORK, N.Y. 10003 / 24-28 OVAL ROAD, LONDON NW1 7DX

The Beckman gamma choice. Big enough to let you be choosy.

Beckman now offers the research and clinical laboratory a complete choice of gamma-counting instruments. Check the features below to find the one instrument that can most effectively satisfy your needs.

The low cost Gamma 4000 is a high performance, bench-top unit featuring ease of operation, 200 or 400 sample capacity, preset and variable windows, and a choice of print-out devices. The optional DP-5000 computer/printer provides on-line data reduction capability—for Radio-Immunoassay final answer calculations.

The Gamma 7000 is micro-processor controlled and offers high performance features with push-button simplicity. Permanently stored counting programs eliminate all knobs, manual controls and switches to make operation fast, easy and more reliable. Simply select the desired program, load samples and depress the AUTO pushbutton—a completely simple and thorough approach to counting.

The Gamma 8000 takes micro-processor-control one step further and allows the user to design special counting programs, while maintaining the simplicity of operation unique to Beckman Instruments.

Finally, there's the Gamma 9000 with the ultimate in data-handling capability. Built right into the 9000 is a complete computer that both controls the operation of the instrument and takes your data through to final answer.

Of course, if you're really going to be choosy about your next gamma instrument, you'll need complete technical information. Why not get it now?

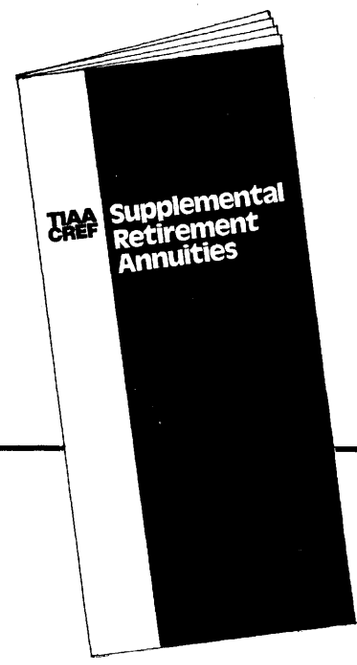
Contact Scientific Instruments Division, Beckman Instruments, Inc., P.O. Box C-19600, Irvine, CA 92713.

Innovation you can count on

Circle No. 89 on Readers' Service Card

BECKMAN®

TIAA-CREF Supplemental Retirement Annuities



for tax-deferred annuity programs

Supplemental Retirement Annuities (SRA's) are new forms of TIAA and CREF contracts designed expressly for use by persons who want to set aside tax-deferred retirement funds over and above amounts being accumulated under their institution's basic retirement plan. They are available for employees of colleges, universities, private schools and certain other nonprofit educational organizations with tax-deferred annuity (salary-or-annuity option) programs. Through a properly drawn agreement with their institution, staff members may divert part of their compensation before taxes to the purchase of these new contracts.

And SRA's are cashable at any time. This means that if the money accumulated by salary reduction is needed before retirement, the SRA contracts can be surrendered for their cash value. Benefits, whether payable in cash or as income, are taxable as ordinary income when received.

For more information and answers to questions send for your copy of the booklet on Supplemental Retirement Annuities.

Send me a booklet describing
TIAA-CREF Supplemental Retirement Annuities.

TIAA CREF

Name _____
Date of Birth

Address _____
Street

_____
City State Zip

Nonprofit
Employer _____

Teachers Insurance and Annuity Association
730 Third Avenue, New York, New York 10017

wi

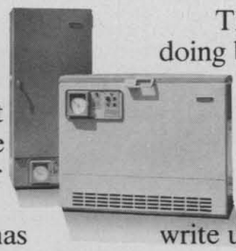
It's tough to make it with nothing more than a face lift.

Trying to cover up an unsuitable product with cosmetic surgery is tricky business in the freezer business.

But that doesn't stop a lot of people from trying.

Too many manufacturers take their home-style freezers, slap on a new label and a new coat of paint, and try to pawn them off as laboratory models. And when they succeed, they've made it possible for you to fail.

As you well know, blood and other biomedical samples are far too important to entrust to anything less than the finest laboratory freezer system money can buy.



That's why Revco has become the number one name in laboratory freezers. Because our laboratory line is our only line, not a sideline. And it's the most professional, most complete, most dependable line available anywhere.

That's the way we've been doing business for 40 years now, and we expect to keep on doing it the same way.

For further information and a copy of our new full-color catalog just call or write us at 1100 Memorial Drive, West Columbia, S.C. 29169. Area Code 803/796-1700. TWX: 810-666-2103. Cable: Revco.

REVCO

The world's leader in ULTra-Low® temperature equipment.

Circle No. 87 on Readers' Service Card

LETTERS

Technological Innovation

I was extremely interested in William D. Carey's editorial "Science in the political economy" (17 Nov. 1978, p. 703). I agree with the assessment that the budget restraints we are facing make it critical that the money spent by the federal government for research and development bring the greatest possible return. Not only should we be selective in our research funding, but we must also create the best climate for bringing the fruits of federal research to the people in the form of new products and technology. Unfortunately, the present policy of federal government retention of patent rights on inventions arising out of federally supported research has resulted in many promising inventions being left to gather dust on the shelves of government agencies. Less than 4 percent of the patents held by the government are ever successfully licensed. This is not a very good return for the billions of dollars we spend on R & D.

There is another trend that has been commented upon in the past in *Science* and is succinctly expressed by this headline, which appeared in the Washington *Post* on 24 November 1978: "U.S. Seen Losing Technological Edge in Some Industries." Because the government provides such a large percentage of all the R & D expenditures in the United States, an inefficient policy which stifles inventiveness hurts our companies who need new technological ideas to compete successfully with increasingly tough foreign businesses.

In the last Congress, I joined a bipartisan group of senators in introducing a bill we feel will answer at least part of these problems. This legislation, the University and Small Business Patent Procedures Act, will allow universities, small businesses, and nonprofit institutions in most cases to retain patent rights for those inventions and processes if they are willing to spend the necessary private funds to develop and market a final product. At the same time, the bill will protect the legitimate rights of the government to enjoy the fruits of the research it helped to fund.

There are now 20 statutes and regulations in effect that give contradictory instructions to the agencies about their ability to grant patent petitions. Sometimes, even within the same agency, there can be different policies among various divisions. The result has been that researchers face a costly maze of confusing rules, many of which require the agency that helped fund the research

to also retain the patent rights for any inventions arising from it.

Early in the next Congress, Senator Robert Dole (R-Kan.) and I again will lead the bipartisan effort to pass this legislation. I realize that getting the most out of our R & D money and the problem of our slumping rate of technological innovation are extremely complex areas. This bill would be an important first step in turning this situation around.

BIRCH BAYH
U.S. Senate, Washington, D.C. 20510

Nitrite in Cured Meats

Philip E. Hartman (Letters, 20 Oct. 1978, p. 260) responds to the article by R. Jeffrey Smith (News and Comment, 8 Sept. 1978, p. 887), which says researchers have estimated that less than 20 percent of the nitrite entering the human stomach is derived from cured meats. Hartman cites a publication by White (*1*) giving a figure of 21.2 percent and considers this the best currently available information. On the basis of White's estimate that cured meats contribute 9.4 percent of ingested nitrate and other evidence that some of the dietary nitrate is absorbed by the body, secreted in the saliva, and then reduced to nitrite in the oral cavity, Hartman suggests that the nitrate in cured meats may "possibly contribute an additional 6.8 percent of gastric nitrite." Adding this figure to White's value of 21.2 percent, Hartman obtains a total of 28 percent.

Hartman's estimate appears to be too high. The data on which it is based overestimate the current exposure to nitrite and nitrate in cured meats because they are based on analyses of cured meat samples taken years ago. Nitrite and nitrate residues in cured meats are now reduced because of recent changes in manufacturing practices.

S. R. Tannenbaum *et al.* (Reports, 30 June 1978, p. 1487) found that nitrite and nitrate are formed in the human intestinal tract. Hence, the human body as a whole is exposed to more nitrite- and nitrate-nitrogen than enters the stomach from the oral cavity. On the basis of the data by White and Tannenbaum *et al.*, I estimated (*2*) that as much as 2 percent of the exposure of humans to nitrite in the United States is a consequence of consumption of meats cured with nitrite. The remaining 98 percent of the exposure is from other sources, which seem to be almost exclusively dietary nitrogenous substances other than nitrite that undergo transformation in the digestive tract with production of some ni-

trite. I pointed out that the very small reduction in total hazard from nitrite that could be achieved by eliminating its use in meat curing must be balanced against (i) the increase in hazard from botulism, should the meat continue to be handled as at present, (ii) the increase in cost if all the meat now containing nitrite were to be handled as fresh meat, and (iii) the loss of value to consumers who would be unable to purchase the cured meats they desire.

CHARLES A. BLACK
Council for Agricultural Science and Technology, Iowa State University, Ames 50011

References

1. J. W. White, Jr., *J. Agric. Food Chem.* **24**, 202 (1976).
2. C. A. Black, "COMMENTS from CAST" (1978-8, Council for Agricultural Science and Technology, Ames, Iowa, 1978).

OSHA Carcinogen Regulations

Philip H. Abelson, in his editorial "Regulating exposure to carcinogens" (13 Oct. 1978, p. 139), argues that regulations recently proposed by the Occupational Safety and Health Administration (OSHA) "invite ridicule, contempt, and noncompliance" by including laboratory workers along with production workers within their scope. "Professional scientists who have only occasional exposure to chemicals," he maintains, "must comply with rules designed for untrained workers exposed chronically."

Ignoring, for the moment, the content of the regulations to which Abelson objects, we question the validity of the position he represents. Our cumulative experience in both academic and private laboratories has demonstrated the ubiquity of chemical hazards in such environments. In one workplace of recent experience we were expected to work continuously over open containers of benzene, tetrahydrofuran, carbon tetrachloride, and other dangerous and volatile solvents. This laboratory, like most in the institution, did not have a ventilation hood that met federal requirements. Another situation involved having to work alongside a fellow employee handling explosive ethers while he smoked cigarettes. In this case management considered the employee's skills too valuable to risk taking measures to prevent his behavior. A final example is that of the increasing use of ethidium bromide in DNA research despite evidence that it is a potent animal carcinogen. We wonder who the "100,000" workers are, "whose most serious laboratory exposure is to ethyl alcohol."

Statistical studies support our view that scientific laboratories are legitimate targets for OSHA regulations. Some evidence was presented by *Science* itself in a News and Comment article of 3 November 1978. As these results, indicating elevated cancer incidence among chemists, probably can be generalized only to "principal investigators," one wonders what the incidence is among bench-workers.

This question brings up what we consider to be another fault in Abelson's argument. He seems to regard the laboratory as a temporary habitat where the highly trained principal investigator occasionally travels to test his theories. In reality, however, a research laboratory today is a production line at which teams of workers, including high school dropouts and Ph.D.'s, work under considerable pressure and supervision to "produce results" for research directors who spend a small fraction, at best, of their own time in the laboratory.

What is more, these research workers are rarely organized into unions. Frequently students in transit, sometimes Ph.D.'s who believe professionalism is incompatible with collective bargaining, they are without a means of self-protection.

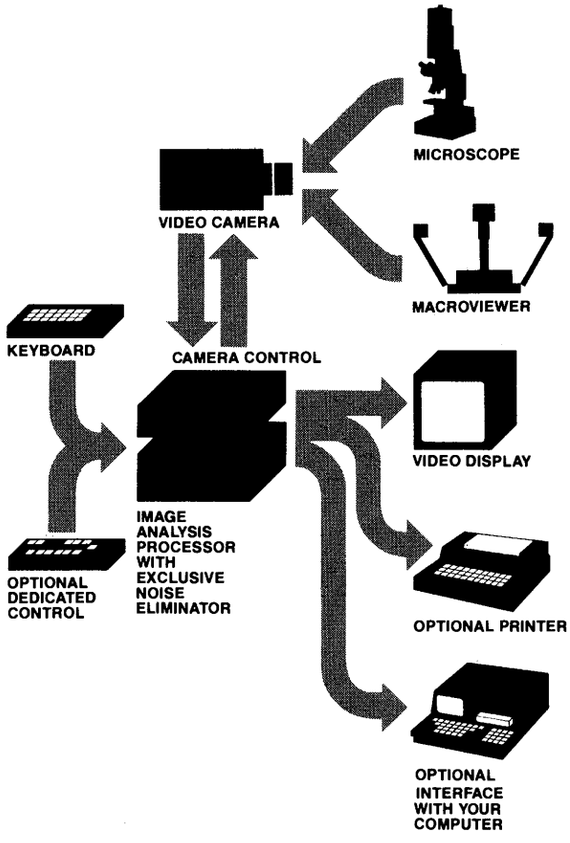
We also disagree with Abelson's characterization of the specifics of the proposed OSHA rules. Quarterly monitoring of a workplace is minimal procedure when one is dealing with potential carcinogens; some facilities should be monitored hourly. Protective clothing is also a token precaution, as it does nothing to alter the unsafe environment and frequently imposes discomfort upon the worker. Since we are now all aware that some carcinogens act over a time frame of 30 years, it should not be difficult to understand the need to maintain records for 40 years.

There is no doubt that OSHA, understaffed and underfunded, is capable of producing some unacceptably crude guidelines. These are frequently promulgated as tentative, giving affected parties ample opportunity to lobby the agency. In fact, the "tentative" nature of the regulations may be viewed as a loophole designed for manufacturers' and other institutions' objections. In any case, Abelson's insinuation that, because the Secretary of Labor must approve all changes, these regulations are not in fact tentative is unfounded. Procedurally, all departmental authority is vested in the Secretary. Thus, while the *Federal Register* may refer to him as the final authority, most responsibility is delegated to his staff or agencies within the Department of Labor. This particular aspect

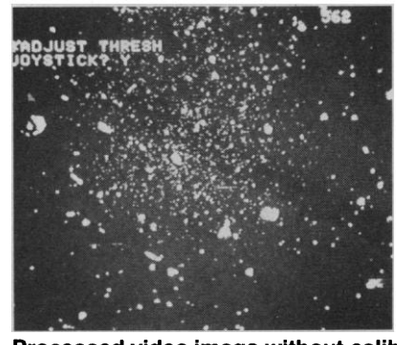
NEW
POLYPROCESSOR™
IMAGE ANALYSIS SYSTEM

WITH NOISE ELIMINATOR–ENHANCES DEFINITION OF LOW CONTRAST OBJECTS

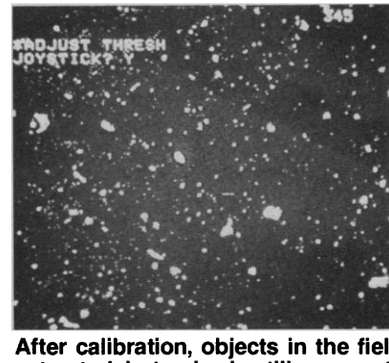
C-1285



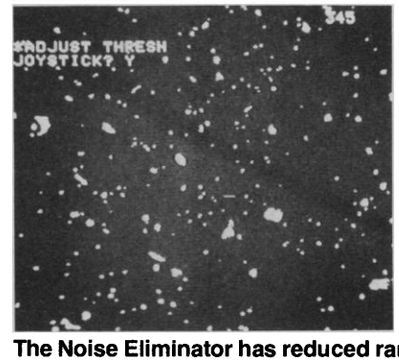
CALL OR WRITE FOR BROCHURE



Processed video image without calibrations. The field is not uniform. The image center has considerable noise, while objects at the corners are lost.



After calibration, objects in the field are uniformly extracted, but noise is still apparent. This noise tends to mask the presence of small objects.



The Noise Eliminator has reduced random noise, enhancing the definition of small or low contrast objects.

HAMAMATSU

Hamamatsu Systems, Inc., 332 Second Avenue, Waltham, Massachusetts 02154 • 617/890-3440

of regulatory "gobbledygook" is well known.

In conclusion, we object to Abelson's blatant endorsement of a position that is not in the best interest of the vast majority of the members of the AAAS, not to mention the entire practicing scientific community.

ELIZABETH S. ALLEN
Columbia University School of Public Health, New York 10021
DEBORAH LINDSAY
University of California, Santa Cruz
VINCENT P. MILLER
Columbia University School of Public Health

Abelson's editorial concerning the OSHA Generic Carcinogen Standard reflects time-honored views held in many laboratories regarding safety and health. These views are not unlike those held by many industries in their resistance to changing their safety and health policies.

Abelson implies that professional scientists are somehow set apart from workers in a factory in their exposure to hazardous materials. There are few workplaces in this country that are as potentially hazardous as research establishments. Professional scientists are not routinely warned about the toxicity of materials they are working with, and they face the same problems as the untrained worker when handling many new chemicals. Hazard ratings, reporting procedures, information disbursement, and exposure control—all provided for by OSHA—are needed in laboratories. I am pleased to see that OSHA has finally made an impact on the research community.

CONRAD D. VOLZ
Department of Industrial and Environmental Health Sciences, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pennsylvania 15260

Abelson's editorial of 13 October struck a responsive chord in me because I am concerned with complying at this institute with OSHA's present carcinogenic regulations (OSHA 2204); with the National Institutes of Health (NIH) "Laboratory safety monograph, a supplement to the NIH guidelines for recombinant DNA research"; with the Nuclear Regulatory Commission's ALARA directives; with a preliminary draft of the NIH proposals concerning a general biohazards control; with OSHA's proposed regulations for category I carcinogens; and with the full OSHA regulations relevant to laboratory safety. All of these directives have benevolent intentions, but many of them seem to have been drawn up with no regard to efficacy or cost-benefit analysis.

For example, a wide range of commonly used organic solvents (benzene, chloroform), liquid scintillation chemicals (toluene, dioxane), and nickel and cadmium salts are designated as carcinogens. Rules now promulgated for industrial exposure may be extended to personnel in research and analytical laboratories. One such requirement is that the employer must ensure that the worker remove all clothing exposed to carcinogens at the end of the working day; the employer must also have the clothing cleaned. As there is no lower limit on exposure to carcinogens defined for this regulation, I presume that the pickup and laundry workers will, in turn, be warned of their potential exposure and will wear appropriate clothing, again to be washed, and so on.

A far more costly proposal is the requirement for medical surveillance of all workers potentially exposed to carcinogens, recombinant DNA, and bacterial or viral agents. Such surveillance has its place; it would be appropriate for every worker exposed to infectious agents to have a serum sample collected upon first being employed and to be subsequently checked after known exposure or after overt symptoms of disease appeared. However, are regular medical checks, unless very frequent, likely to coincide with the first appearance of infection or cancer? A more cost-effective program would be to require the employer to cover the cost of medical examination that the worker incurs in the belief that the symptoms relate to biohazard exposure.

From our present knowledge of radiation carcinogenesis, the only certain result we can foresee from regular surveillance would be an increased risk from that procedure itself. Without careful assessment of risks let us not mandate another expensive and dangerous program, particularly not for research laboratory workers where the hazard may come from varied agents and brief and irregular exposure.

Abelson correctly points out the practical shortcomings of these proposed regulations governing laboratory safety but does not emphasize sufficiently, in my opinion, the unnecessary cost that will be engendered if such regulations are enforced—at a time when the Office of Management and Budget is muttering threateningly about the continuing rise in overhead costs of doing research.

PETER F. DAVISON
Boston Biomedical Research Institute, Boston, Massachusetts 02114

NATO ADVANCED STUDY INSTITUTES 1979

● The purpose of the Advanced Study Institutes (ASI) Programme, one of the main activities of the NATO Science Committee, is to disseminate advanced scientific knowledge and to allow formation of contacts among scientists from different countries. ● ASIs are intended to be meetings where a small faculty of internationally known experts teaches a carefully defined subject in a coherent lecture programme. Generally, about 100 scientists are admitted and take an active part in the meeting. ● The Advanced Study Institutes listed below, sponsored or co-sponsored by NATO, are organised under the entire responsibility of the director of the institute or his organising committee. ● Scientists with adequate background and interest who wish to participate in one of the institutes should **contact the director** of the particular institute well in advance of the dates indicated. ● A limited number of grants are available to defray part of the expenses of deserving participants. These grants can only be obtained through application to the ASI director.

NOTE : ● Location and dates may be subject to change. ● The proceedings of most of the courses are published in the NATO ASI Series. For information on publications write to : Scientific Affairs Division, NATO, B-1110 Brussels (Belgium). ● For reasons of space some of the titles have been abridged.

The Mechanism of Continental Drift and Plate Tectonics ; 27/3-10/4/79 ; Newcastle, UK	Prof. S.K. Runcorn Univ., Physics School ; Newcastle, NE1 7RU, UK
Ordering in Strongly-Fluctuating Condensed-Matter Systems ; 16-27/4/79 ; Geilo, Norway	Dr. T. Riste Inst. for Atomenergi ; P.O. Box 40 ; 2007 Kjeller, Norway
Theor. Meth. for Interaction of E.M. Waves with Structures ; 23/4-5/5/79 ; Darlington, UK	Dr. J.K. Skwirzynski GEC-Marconi Electronics Ltd. ; Gr. Baddow, Chelmsford, Essex, UK
Galatic X-Ray Sources ; May 1979 ; Greece	Dr. P.W. Sanford Univ., Mullard Space Science Lab.; Dorking, Surrey, UK
Cosmology and Gravitation : Spin, Torsion and Rotation ; 5-18/5/79 ; Erice, Italy	Prof. P.G. Bergmann ; Univ., Physics Dept. ; Syracuse, N.Y. 13210, USA
Magnetic Resonance in Colloid and Interface Science ; 25/6-6/7/79 ; France	Prof. J. Fraissard Univ., T.55, Lab. Chimie d. Surfaces ; Pl. Jussieu, 75230 Paris, France
Vibrational Spectroscopies of Molecular Liquids and Solids ; 25/6-7/7/79 ; Menton, France	Prof. S. Bratos Univ., T.16, Lab. Phys. Théor. d. Liquides ; Pl. Jussieu, 75230 Paris, France
Chronobiology, Shifts in Schedules, with Emphasis on Man ; 26/6-7/7/79 ; Italy or Germany	Prof. L.E. Scheving Univ., Anatomy Dept.; Little Rock, Arkansas 72201, US
Spoken Language Generation and Understanding ; 26/6-7/7/79 ; Bonas, France	Prof. J.C. Simon Univ., Inst. de Programmation ; Pl. Jussieu ; 75005 Paris, France
Sludge Characteristics and Behaviour ; July 1979 ; Newark, Delaware, US	Dr. J.B. Carberry Univ., Civil Engineering Dept.; Newark, Delaware 19711, US
Cooperative Phenomena in Two Dimensions ; 20-31/8/79 ; Banff, Alberta, Canada	Dr. B. Bergersen Univ. UBC, Physics Dept.; Wesbrook Pl.; Vancouver, BC, Canada V6T 1W5
Developments in Language and Cognition : Sign Language Res. ; 22-31/8/79 ; Aix-Marseille. Fr.	Prof. H. Lane N.E. Univ., Psychology Dept.; Huntington Ave.; Boston, Mass. 02115, US
Lasers in Biology and Medicine ; 19/8-1/9/79 ; Versilia, Italy	Prof. F.T. Arecchi C.I.S.E., PO Box 3986 ; 20100 Milan, Italy
Chemistry and Chem. Engineering of Catalytic Processes ; 20/8-1/9/79 ; Eindhoven, NL	Prof. G.C.A. Schuit TH. Lab. for Inorganic Chemistry ; Eindhoven, Netherlands
Nucleic Acid Protein Recognition ; 20/8-2/9/79 ; Spetsai, Greece	Dr. M. Buckingham Inst. de Biol. Moléc., Inst. Pasteur ; 75015 Paris, France

Nucleoside Analogues : Chem., Biol., Medical Applications ; 7-18/5/79 ; Urbino, Italy	Dr. R.T. Walker Chemistry Dept., PO Box 363 ; Birmingham, B15 2TT, UK
Neural Development ; 20-30/5/79 ; Erice, Sicily, Italy	Prof. D.H. Hubel Harvard Medical School ; Shattuck Str.; Boston, Mass. 02115, US
Bioenergetics and Thermodynamics ; 21/5-1/6/79 ; Parma, Italy	Prof. A. Braibanti Univ., Ist. di Chimica Farmaceutica ; 43100 Parma, Italy
Methodologies for Analyzing Human Growth and Development ; 28/5-7/6/79 ; Urbino, Italy	Prof. C. Susanne Free Univ., Human Genetics Lab., ; 1050 Brussels, Belgium
Radiationless Processes ; 1-17/6/79 ; Erice, Sicily, Italy	Prof. B. di Bartolo Boston College, Physics Dept. ; Chestnut Hill, Mass. 02167, US
Stresses in the Earth's Lithosphere ; 2-16/6/79 ; Corsica or Greece	Prof. C. Froidevaux Bât. 510, Université de Paris Sud ; 91405 Orsay, France
ESR/NMR of Paramagnet. Species in Biol. and Related Systems ; 3-15/6/79 ; Firenze, Italy	Prof. I. Bertini Cattedra di Chim. Gen.; Via Capponi 7 ; Firenze, Italy
Mathematical Modelling of Energy Systems ; 9-23/6/79 ; Istanbul, Turkey	Prof. I. Kavrak Bogazici Univ., Industrial Eng. Dept.; Istanbul, Turkey
Motor Learning and Control ; 10-20/6/79 ; Marseille, France	Dr. G.E. Stelmach Univ., Motor Behaviour Lab. ; Madison, Wisconsin 53705, US
Phase Transitions in Surface Films ; 11-25/6/79 ; Erice, Sicily, Italy	Prof. J.G. Dash Univ., Physics Dept., FM-15 ; Seattle, Washington 98195, US
Topics in Theoretical Organic Chemistry ; 18-28/6/79 ; Gargnano (Garda), Italy	Prof. A. Mangini Univ., Ist. di Chimica Organica ; 40136 Bologna, Italy
Contingency Table Analysis Techn. f. Road Safety Studies ; 18-29/6/79 ; Urbino, Italy	Prof. G.A. Fleischer Traffic Safety Center, USC ; Los Angeles, Calif. 90007, US
Map Data Processing ; 18-29/6/79 ; Italy	Prof. G.G. Pieroni Univ., Centro di Calcolo ; Cosenza, Calabria, Italy
Algebraic and Geometric Meth. in Linear System Theory ; 19-30/6/79 ; Cambridge, Ma., US	Prof. R.W. Brockett Harvard Univ., Pierce Hall ; Cambridge, Mass. 02138, US
Human Operator Models ; Summer 1979 ; Delft, Netherlands	Prof. H.G. Stassen TH, Mech. Eng. Dept., Measurement Lab; 2628 CD Delft, Netherlands
Physics induced by Chemical Defects in Refractory Oxides ; 24/6-8/7/79 ; Corsica, France	Dr. P. Thevenard Univ., Dépt. de Physique des Matériaux ; 69621 Villeurbanne, France
Bifurcation Phenomena in Math. Physics and Related Topics ; 24/6-8/7/79 ; Corsica, France	Dr. D. Bessis Theor. Div., C.E.N. - Saclay ; B.P. no. 2 ; 91190 Gif-sur-Yvette, France
X-Ray Astronomy ; 1-14/7/79 ; Erice, Sicily, Italy	Prof. G. Setti C.N.R., Ist. di Fisica "A. Righi" ; 40126 Bologna, Italy
Aspects of Contemporary Complex Analysis ; 1-20/7/79 ; Durham, UK	Dr. D.A. Brannan Queen Elizabeth College, Math. Dept. ; London, W8 7AH, UK
Factors influencing Urban Design : a Systems Approach ; 2-13/7/79 ; Louvain-la-Neuve, B.	Dr. P. Laconte Univ., SERES ; Ave. Lemaître 13 ; 1348 Louvain-la-Neuve, Belgium
Physical Cosmology ; 2-28/7/79 ; Les Houches, France	Prof. R. Balian C.E.N.S., Service de Phys. Théor., BP 2 ; 91190 Gif-sur-Yvette, France
Quarks and Leptons ; 8-29/7/79 ; Cargèse, Corsica, France	Prof. M. Lévy Univ. Curie, Phys. Théor. Lab.; 4 Pl. Jussieu, T.16 ; Paris, France
Elementary Particles ; 9-27/7/79 ; Boulder, Colorado, US	Prof. K.T. Mahanthappa Univ. Physics Dept.; Boulder, Colorado 80309, US
Genome Organisation and Expression in Higher Plants ; 11-21/7/79 ; Edinburgh, UK	Dr. C.J. Leaver Univ., Botany Dept., King's Bldgs.; Edinburgh, Scotland, UK
Physics of Nonlinear Electron Transport in Semiconductors ; 16-27/7/79 ; Urbino, Italy	Dr. D.K. Ferry State Univ., Electrical Eng. Dept.; Fort Collins, Colorado 80523, US
Theor. Aspects and New Developments in Magneto-Optics ; 16-28/7/79 ; Antwerp, Belgium	Prof. J.T. Devreese U.I.A., Physics Dept.; 2610 Wilrijk, Belgium
Advanced Chem. Methods for Soil/ Clay Minerals Research ; 23/7-4/8/79 ; Urbana, Illi., US	Prof. J.W. Stucki Univ., Agronomy Dept., Turner Hall ; Urbana, Illinois 61801, US
Laser-Plasma Interactions ; 30/7-17/8/79 ; St. Andrews, Scotland, UK	Dr. E.W. Laing Univ., Natural Philosophy Dept.; Glasgow, Scotland G12 8QQ, UK
Biophysics of Membrane and Intercellular Communication ; 30/7-31/8/79 ; Les Houches, Fr.	Prof. R. Balian C.E.N.S., Service de Phys. Théor., BP 2 ; 91190 Gif-sur-Yvette, France
Mechanics of Flexible Fibre Assemblies ; August, 1979 ; Preveza, Greece	Prof. J.W.S. Hearle Univ., Textile Technology Dept., PO Box 88 ; Manchester, UK
Environmental Physiology of Fishes ; 12-25/8/79 ; Lennoxville, Québec, Canada	Prof. M.A. Ali Univ., Dépt. de Biologie, CP 6128 ; Montreal, H3C 3J7, Canada
Particle Physics ; 12-24/8/79 ; Kaiserslautern, Germany	Prof. W. Rühl Univ., Fachbereich Physik ; PO Box 3049 ; 675 Kaiserslautern, Germany
Atomic and Molec. Processes in Controlled Thermonucl. Fusion ; 13-24/8/79 ; Istanbul, Turkey	Prof. M.R.C. McDowell Math. Dept., Royal Holloway College ; Egham, Surrey, UK
The Biology of Aggression ; 17-26/8/79 ; Newtown, Wales, UK	Dr. P.F. Brain Univ. College, Zoology Dept.; Swansea, SA2 8PP, Wales, UK
Recent Developments in Gauge Theories ; 27/8-7/9/79 ; Cargèse, Corsica, France	Prof. H. Lehmann Univ., II. Inst. f. Theor. Physik ; 2 Hamburg 50, Germany
Characterization of Crystal Growth Defects by X-Ray Meth.; 31/8-8/9/79 ; Durham, UK	Dr. B.K. Tanner Univ., Physics Dept., South Rd.; Durham, DH1 3LE, UK
Endoperoxide, Prostacyclin, Thromboxane Research ; 2-13/9/79 ; Erice, Italy	Prof. G.P. Velo Univ., Dept. Pharmacology, Policlinico ; 37100 Verona, Italy
Atmospheric Ozone : its Variations and Human Influences ; 2-14/9/79 ; La Baule, France	Prof. M. Nicolet Univ., 30 Ave. Den Doorn, External Geophysics ; Brussels, Belgium
Physics and Chemistry of Low-Dimensional Solids ; 2-14/9/79 ; Estoril, Portugal	Dr. L.J. Alcácer Lab. de Fisica, Radioquimica Dept.; Sacavém, Portugal
Amorphous and Liquid Metals ; 2-15/9/79 ; Zwiesel, Bavaria, Germany	Prof. E. Lüscher Technische Universität, Physik-Dept.; 8046 Garching, Germany
Transfer of Cell Constituents into Eukaryotic Cells ; 2-16/9/79 ; Algarve, Portugal	Dr. J.E. Celis Univ., Inst. of Chemistry ; 8000 Aarhus C, Denmark
Photorecept. - Sensory Transduction in Aneural Organisms ; 3-14/9/79 ; Camaiore, Italy	Dr. F. Lenci C.N.R., Lab. Fisiche Biomol. Cellule ; 56100 Pisa, Italy
Systems Analysis and Reservoirs Management ; 3-14/9/79 ; Lisbon, Portugal	Prof. L. Valadares Tavares Inst. Sup. Tecnico ; Rovisco Pais Av.; Lisbon, Portugal
Semi-class. Methods in Mol. Scattering and Spectroscopy ; 9-22/9/79 ; Cambridge, UK	Dr. M.S. Child Univ., Theor. Chemistry Dept.; Oxford, OX1 3TG, UK
Mixed-Valence Compounds in Chemistry, Physics, Biology ; 10-21/9/79 ; Oxford, UK	Prof. D.B. Brown Univ., Cook Phys. Sc. Bldg., Chem. Dept.; Burlington, Vermont 05405, US
Quantum Dynamics of Molecules ; 15-29/9/79 ; Cambridge, UK	Dr. R.G. Woolley Cavendish Lab., Madingley Rd ; Cambridge, CB3 0HE, UK
Metal Ions in Biology ; 17-29/9/79 ; Sintra-Estoril, Portugal	Dr. A.V. Xavier Univ., IST, Centro de Quimica Estrutural ; Lisboa 1, Portugal
The Blood-Retinal Barriers ; 18-30/9/79 ; Figueira da Foz, Portugal	Prof. J. Cunha-Vaz Univ., Oftalmologia Centro ; Coimbra, Portugal
Meth. for Interdisc. Research on Nonverbal Behaviour ; 24/9-6/10/79 ; Urbino, Italy	Prof. K.R. Scherer Univ., Psychology Dept.; Behaghel St ; 6300 Giessen, Germany
Biorheology ; 9-21/12/79 ; Houston, Texas, US	Prof. N.H.C. Hwang Univ., Cullen College of Eng.; Houston, Texas 77004, US

Want the only dispenser with a Teflon®-coated plunger?

Ask for the 'Teflon Dispenser.'

Why does a Brinkmann Dispensette seem to work more smoothly than other bottle-top dispensers?

The secret is its Teflon-coated plunger.

Dispensers with glass or polypropylene plastic plungers often 'freeze' or 'stick' when used with alkaline reagents. On a Dispensette, the Teflon coating on the plunger insures smooth operation with any reactive chemical (except HF), even with concentrated acids and bases.

Of course, it takes more than a smoothly-working plunger to make a dependable dispenser. Instead of external glass tubing that could break or chip, Dispensettes are equipped with flexible Teflon filling and discharge tubes that can easily be cut to any desired length. Simply pull them off and a Dispensette is ready for autoclaving at 120°C without further disassembly.

Dispensette offers a wide selection of models for fast, accurate dispensing of volumes from 0.1 to 50ml, with better than ±1.0% accuracy and ±0.1% reproducibility. There is hardly a standard size screw-neck reagent bottle, can or container (even STJ 24/40 and 29/42 glassware) which a Dispensette will not fit, either directly or with optional screw-in adapters.

Some Dispensette design features have been copied by other dispensers, but none has its smooth, foolproof operation. That's because only Dispensette has a Teflon-coated plunger. Write for literature: Brinkmann Instruments, Inc., Cantiague Rd., Westbury, N.Y. 11590. In Canada: Brinkmann Instruments (Canada), Ltd.

Brinkmann Dispensette®

Available from: Ace Scientific
Beckman Instruments, Science Essentials Operations
Bio-Rad Laboratories/Cole-Parmer Instrument Co.
Curtin Matheson Scientific/Fisher Scientific
General Scientific/Markson Scientific/Preiser Scientific
Sargent Welch/Scientific Products/SGA Scientific
Arthur H. Thomas/VWR Scientific/Wilkens-Anderson Co.

Dispensette® is a registered trademark of R. Brand Co.
Teflon® is a Du Pont trademark.

Circle No. 21 on Readers' Service Card

12 January 1979, Volume 203, Number 4376 **SCIENCE**

Power in Washington

From time to time scientists inquire about why their needs and their opinions seem to receive little attention in Washington. There are many reasons. One is the climate of the times. Another is that scientists compete with increasing demands of others who have converged on the capital, all seeking to achieve or obtain something.

The past decade has seen a tremendous concentration of power in Washington and a large increase in the number of those in a position to use it. In Washington, power usually accompanies control over money, and the pots of gold are many. First, there is the $500-billion federal budget. A piece of that is worth fighting for. Less visible, but perhaps more important, are regulatory decisions that can determine the prosperity or destruction of major industries. For example, radio and television stations are licensed by the federal government, and renewals come up every 3 years. Another set of decisions has to do with foreign dumping of products. Power over industry is illustrated by the fact that the making of steel entails compliance with 5700 regulations. Virtually all of them have some effect on the ability of the industry to compete, to survive, and to be profitable.

In dealing with agencies of the federal government, lawyers are usually the chosen instrument. Some 700 lawyers make a comfortable living for their efforts involving the Federal Communications Commission. I have made inquiries about the total number of lawyers participating in government matters; no one seems to know. The membership of the Washington Bar Association is about 25,000; a major part of this group deals with the government. In addition, a large number of lawyers appear from around the country, and some of the local lawyers who work on government matters are not members of the Washington bar.

The power center that is Washington has attracted an ever-increasing number of organizations seeking to influence what goes on here. A partial enumeration of these organizations is to be seen in the Yellow Pages of the telephone book. Some 1900 organizations are listed under the heading "Associations." Some are local or small or not particularly concerned with government. But others are large and active. Examples include the Air Line Pilots Association, the National Coal Association, and the National Education Association. In addition, many organizations, such as public interest groups, labor unions, trade organizations, and corporations, engage in efforts to influence the government.

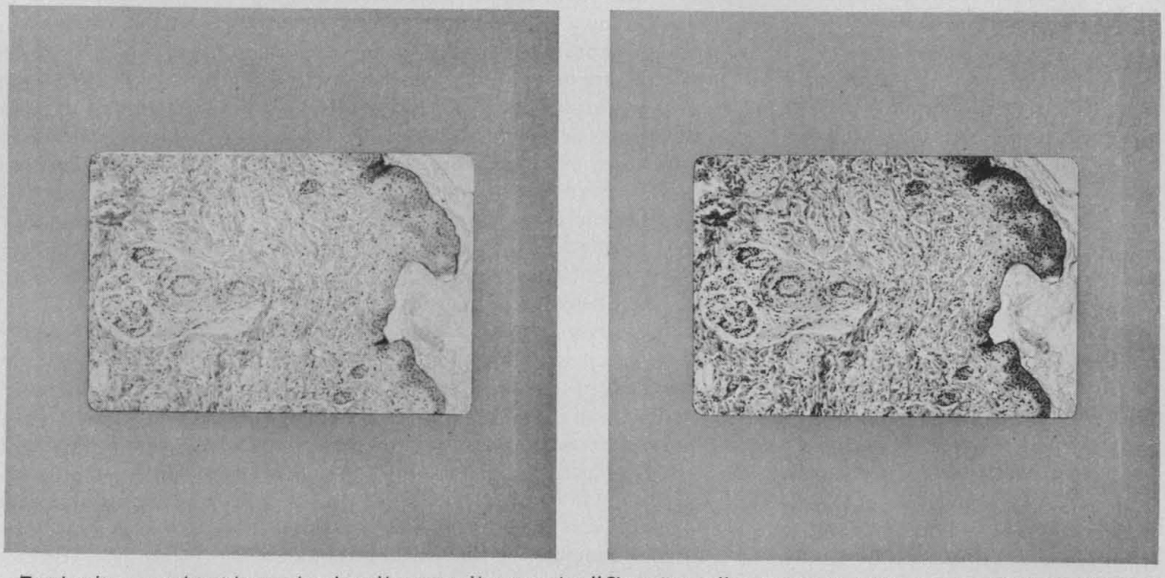
Whom do the tens of thousands of would-be influencers work on? Many, of course, would like to have the ear of the President or, failing that, of the Vice President, the White House staff, or a Cabinet officer. On the executive side of the government, most have to be content with civil servants, who by their sheer numbers and by their duties have enormous total power. On Capitol Hill there are many targets in addition to senators and representatives. A recent count shows 20,000 people on various congressional staffs. The majority are aides to congressmen; others are on staffs of committees. For example, the Senate Judiciary Committee has a staff of about 300.

In addition to contact with the Administration and Congress, the influencers work effectively in other ways. A prime target is the media, which are vulnerable to skillfully prepared material and responsive to the right kinds of press conferences.

One approach to influencing any particular issue in Congress is to identify the relevant key members of Congress and the people in their home districts who influence them. Means are then found to intercede with the congressmen at a crucial moment just before the votes are taken. This technique involves knowing when legislation is likely to mature and the key people involved, timing, computer printouts of information, and many telephone calls. When billions of dollars are at stake, a commensurate effort is indicated. With that kind of game preoccupying Washington, scientists should feel fortunate that they obtain as much attention as they do.

—PHILIP H. ABELSON

Our slide duplicator eliminates a lot of Original Sins.



Exclusive contrast control unit permits you to "fine tune" contrast with controlled flashing.

The Bowens Illumitran not only gives great, low-cost color slide dupes, it actually lets you eliminate undesirable effects on the original slides.

How? With an exclusive contrast control that permits you to reduce and "fine tune" contrast, and equally important, lets you vary the color of shadow areas without affecting highlight reproduction.

You can get contrast control as part of a new Illumitran, or (for current Illumitran owners), it can be purchased separately and added to older Illumitran units.

Of course, contrast control is just one of the features that make the Illumitran a tremendously versatile tool for scientific and technical photography.

Get all the facts. Write for our Illumitran literature.

Bogen Photo Corp.,
100 So. Van Brunt St.
PO Box 448, Englewood, NJ 07631

bogen

Lester Bogen doesn't sell anything he wouldn't buy himself.

Circle No. 19 on Readers' Service Card

PRODUCTS and MATERIALS

Liquid Chromatograph

The 7500 gradient liquid chromatograph is microprocessor-controlled for HPLC applications. The 740 control module houses a printer/plotter that prints a report for each chromatogram. Features include automatic and manual injectors, fixed and variable wavelength detectors, and other modular components. The solvent mixer allows for accurate programmed low-pressure solvent blending. The column compartment is temperature-controlled for stability and to increase the speed of analysis. The injector can initiate 192 analyses of up to 64 samples each. Micromeritics Instrument. Circle 750.

Temperature Monitor

The Profiler simultaneously displays up to 60 thermocouple outputs on a large-screen cathode-ray tube with 0.2°C resolution for type K thermocouples. A digital thermometer that measures temperatures from −200° to 2328°C assures compatibility with eight types of thermocouples. A selection of standard and custom-built thermocouple assemblies is available to complement the Profiler. Kazmierowicz Instrument. Circle 751.

Battery-Powered Scalpel

The Vibra-Scalpel is designed for precise gross sectioning of many biologic materials. It is suitable for use with human tissue prior to cryostatic microtomy and for both plant and animal dissection. The device is supplied with a recharging accessory and with a selection of common-sized blades. Blades are easily changed and the recharging accessory doubles as a stand to hold the instrument when it is not in use. Potomac Scientific. Circle 752.

Amino Acid Analyzer Kit

A kit is available to construct an instrument that will analyze peptide hydrolyzates in 38 minutes; full-scale response may be obtained with 100 picomoles of aspartic acid. Automatic sample injectors and digital data analyzers are available as options. Solid-state temperature controls and a stainless steel column complement the modular construction. Ninhydrin or fluorescent detection may be selected. An instruction manual is included and technical consultation pursuant to various applications is also available from the manufacturer. Dionex. Circle 753.

Electronic Balances

Three new balances—the 300, 1500, and 1500D—offer microprocessor control and easily visible readouts. There is an indicator to the operator that the display is stabilized and that the reading may be taken. An out-of-range indicator alerts the operator if the balance's capacity is exceeded by the sample. The model numbers 300 and 1500 reflect the limits of the new units in grams. The 1500D offers two weighing sensitivities: tenths and hundredths of a gram. Tare measurements go to the weight limit of each model. These models are suited for classrooms and laboratories. Ohaus Scale. Circle 754.

Plasma Spectrometer

The Plasma-100 is an inductively coupled plasma spectrometer which may be programmed to determine any number of elements at any wavelength. The operator selects parameters from a video display including wavelength, background correction, and the portion of a plasma to be observed. The selected program may be stored and used in future analyses. Two rapid-scanning, double monochromators are driven by stepping motors from one wavelength to the next with reference to emission lines from a mercury source. Ten to 20 elements may be determined per minute with data displayed and recorded. Instrumentation Laboratory. Circle 755.

Electron Microscope

The EM 109 is a transmission device with 3.44-angstrom resolution. Specimens are protected against excessive irradiation and contamination is eliminated. Trans-Fiber Photography is a patented process in which the camera is outside the vacuum. Micro-Dose Focusing reduces the specimen's exposure and Ion-Getter Pumping maintains freedom from contamination. Magnification ranges from 150 to 400,000 power and accelerating voltages are 50 and 80 kilovolts. Carl Zeiss. Circle 756.

Literature

Gallium Temperature Standard describes the model 60 thermometer calibrator and laboratory temperature standard. Yellow Springs Instrument. Circle 757.

Ultraviolet Detector features Uvicord S for monitoring radiation at 206 nanometers, a wavelength strongly absorbed by nonaromatic peptides, polysaccharides, nucleotides, lipids, and steroids. LKB Instruments. Circle 758.

Glassware Washer and Dryer is devoted to the Jet Clean and Jet Dri devices for laboratory applications. Fisher Scientific. Circle 759.

Scientific and Technical Terms comprise a dictionary that is featured in a new catalog of audiovisual aids for scientists. Beckman Instruments. Circle 760.

Research Chemicals are listed in an extensive catalog that includes carbonyls, organometallic derivatives, metallocenes, metal chlorides, organophosphorus and organoarsenic compounds, liquid crystals, and polymer calibration standards. Pressure Chemical. Circle 761.

Scientific Glassware and Apparatus includes biomedical chromatographic, cryogenic, and distillation apparatus and much more in over 300 pages. Kontes. Circle 762.

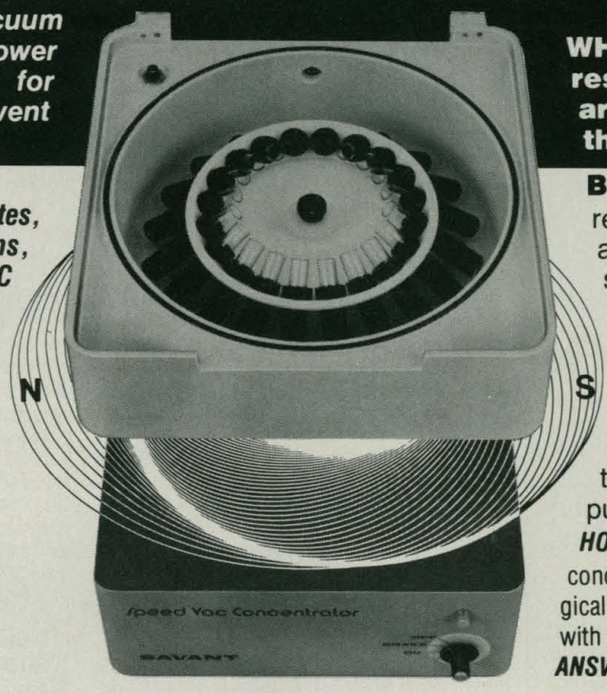
Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (on pages 110E and 198A) and placing it in the mailbox. Postage is free.

—RICHARD G. SOMMER

Savant Speed Vac Evaporator/Concentrator

NOW WITH MAGNETIC DRIVE –

Isolates the upper vacuum chamber from the lower motor drive section – for more efficient solvent evaporation.



WHY — are so many research laboratories around the world using the Savant Speed Vac?

Acid Hydrolysates, Eluates, Extracts, Dialysed Solutions, Preparing Samples for GLC or HPLC in Biomedical Research, Clinical Chemistry, Radioimmunoassays, Mass Spectromotry.

Use with standard culture tubes, tapered tubes, mini vials, silylation vials.

BECAUSE —100% sample recovery . . . Evaporates and concentrates at the same time... No splash... No smearing ... 20 to 100 samples at one time.

SIMPLE OPERATION — Load 20 to 100 samples in the rotor, close lid, turn to "on" and turn vacuum pump "on".

HOW ELSE can you evaporate and concentrate small volumes of biological samples in quantity at one time with maximum efficiency?

ANSWER — There is no other way!

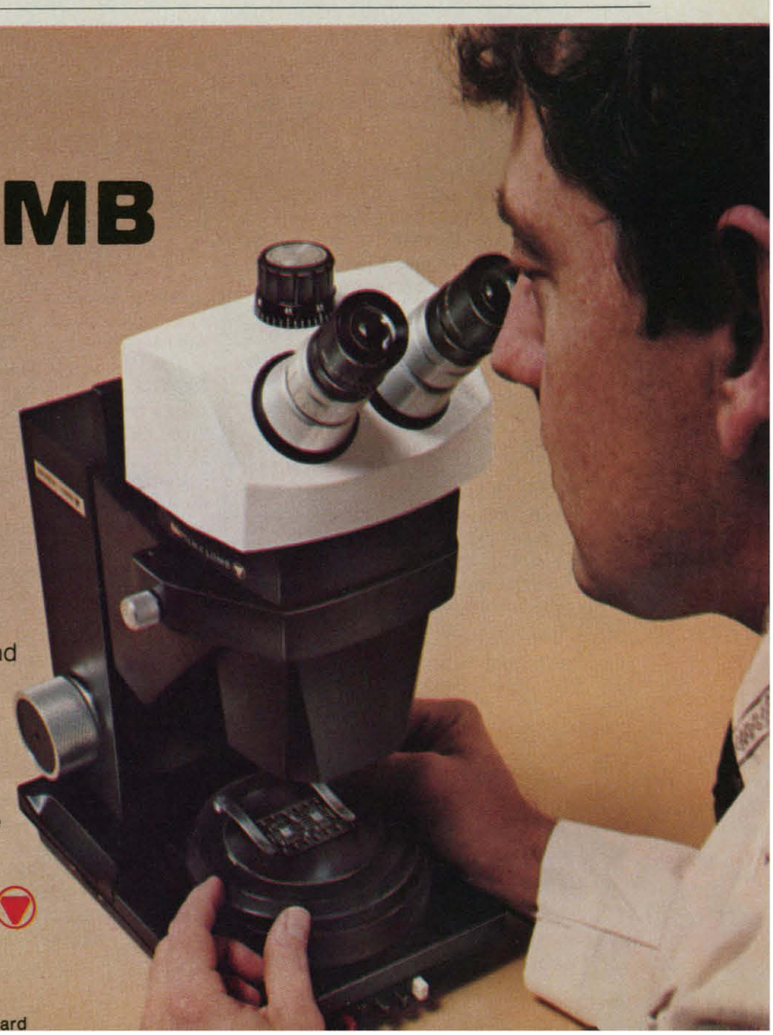
Send for illustrated literature to:
SAVANT INSTRUMENTS, INC.
221 Park Ave.
Hicksville, N.Y. 11801
Phone: (516) 935-8774

Circle No. 4 on Readers' Service Card

THINK **BAUSCH & LOMB** RELIABILITY

Since BAUSCH & LOMB introduced the first zooming stereo microscopes in 1959, more and more people all over the world have selected and used StereoZoom® microscopes than any other instruments of their kind. And for good reasons . . . like an optimum balance of resolution and depth of field from precision optics and highly reliable mechanical components; unmatched variety of illuminators, stands, and accessories; precise photomicrographic exposure capabilities; as well as dependable, time-tested construction. The StereoZoom microscope is the one instrument you can rely on to help you do your job better year after year. Find out which StereoZoom microscope is best suited to handle the job for you. Write or call BAUSCH & LOMB for a detailed StereoZoom microscope catalog or a personal demonstration. THINK BAUSCH & LOMB . . . the name in reliable microscopes since 1874.

BAUSCH & LOMB StereoZoom microscopes 20 ANNIVERSARY



In CANADA: BAUSCH & LOMB Canada Ltd.
2001 Leslie St.
Don Mills, M3B2M3, Ontario, Canada
(416) 447-9101

BAUSCH & LOMB
Scientific Optical Products Division
ROCHESTER, NEW YORK 14602 USA
716-338-6000. TWX 510-253-6189
TELEX 97-8231. CABLE: BAUSCH & LOMB

Circle No. 43 on Readers' Service Card

BOOKS RECEIVED AND BOOK ORDER SERVICE

(Continued from page 164)

E/MJ Operating Handbook of Mineral Surface Mining and Exploration. Richard Hoppe, Ed. McGraw-Hill, New York, 1978. vi, 450 pp., illus. $19.50. E/MJ Library of Operating Handbooks, Vol. 2. *To order this book circle No. 556 on Readers' Service Card*

English Towns 1500–1700. John Patten. Dawson, Folkestone, England, and Archon Books (Shoe String Press), Hamden, Conn., 1978. 348 pp., illus. $25. Studies in Historical Geography.

Environmental Impacts of Artificial Ice Nucleating Agents. Papers from a workshop, Vail, Colo., Nov. 1976. Donald A. Klein, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1978 (distributor, Academic Press, New York). viii, 256 pp., illus. $21.

Enzyme Kinetics. Physical Bases, Data Analysis and Uses. Claude Marmasse. Gordon and Breach, New York, 1977. xvi, 226 pp. $22. *To order this book circle No. 557 on Readers' Service Card*

Evaporation-Combustion of Fuels. Papers from a symposium, San Francisco, Aug. 1976. Joseph T. Zung, Ed. American Chemical Society, Washington, D.C., 1978. viii, 296 pp., illus. $31. Advances in Chemistry Series 166. *To order this book circle No. 566 on Readers' Service Card*

Fiber Glass. J. Gilbert Mohr and William P. Rowe. Van Nostrand Reinhold, New York, 1978. xiv, 338 pp., illus. $22.50. *To order this book circle No. 567 on Readers' Service Card*

Food Microbiology. W. C. Frazier and D. C. Westhoff. McGraw-Hill, New York, ed. 3, 1978. xviii, 540 pp., illus. $19.50. *To order this book circle No. 558 on Readers' Service Card*

Fundamentals of Entomology and Plant Pathology. Louis L. Pyenson. AVI Publishing Company, Westport, Conn., 1977. xviii, 328 pp., illus. $19.

Fundamentals of Human Geography. A Reader. John Blunden, Peter Haggett, Christopher Hamnett, and Philip Sarre, Eds. Harper and Row, New York, 1978. x, 382 pp., illus. Paper, $7.95.

Fundamentals of Scaling and Psychophysics. John C. Baird and Elliot Noma. Wiley-Interscience, New York, 1978. xiv, 288 pp., illus. $19.95. Wiley Series in Behavior.

Guide to the Study of Animal Populations. James T. Tanner. University of Tennessee Press, Knoxville, 1978. xiv, 186 pp., illus. $8.95.

Handbook on Desertification Indicators. Based on the Science Associations' Nairobi Seminar on Desertification. Compiled by Priscilla Reining, American Association for the Advancement of Science, Washington, D.C., 1978 (available from the Office of International Science). xviii, 142 pp. Paper. AAAS Publication No. 78-7.

Handbook of Noise Assessment. Daryl N. May, Ed. Van Nostrand Reinhold, New York, 1978. xvi, 400 pp. $22.50. Van Nostrand Reinhold Environmental Engineering Series. *To order this book circle No. 568 on Readers' Service Card*

The Heart Attack Handbook. A Commonsense Guide to Treatment, Recovery, and Prevention. Joseph S. Albert. Little, Brown, Boston, 1978. xiv, 140 pp., illus. $4.95.

Heat Budget Atlas of the Tropical Atlantic and Eastern Pacific Oceans. Stefan Hastenrath and Peter J. Lamb. University of Wisconsin Press, Madison, 1978. xiv, 90 pp. Spiral bound, $35.

Helium. A Public Policy Problem. National Academy of Sciences, Washington, D.C., 1978. xiv, 148 pp. + appendices. Paper, $10.50.

Hepatotoxicity. The Adverse Effects of Drugs and Other Chemicals on the Liver. Hyman J. Zimmerman. Appleton-Century-Crofts, New York, 1978. x, 598 pp., illus. $48.50.

Human Milk in the Modern World. Psychosocial, Nutritional, and Economic Significance. Derrick B. Jelliffe and E. F. Patrice Jelliffe. Oxford University Press, New York, 1978. x, 500 pp., illus. $39.50. Oxford Medical Publications.

Ideology and Social Change in Latin America. June Nash, Juan Corradi, and Hobart Spalding, Jr., Eds. Gordon and Breach, New York, 1977. vi, 306 pp. $14.50. *To order this book circle No. 574 on Readers' Service Card*

Inheritance of Creative Intelligence. Jon L. Karlsson. Nelson-Hall, Chicago, 1978. xii, 206 pp. Cloth, $14.95; paper, $7.95.

Integrated Circuits. Theory and Applications. Charles F. Wojslaw. Reston (Prentice-Hall), Reston, Va., 1978. xiv, 204 pp., illus. $14.95.

International Advances in Surgical Oncology. Vol. 1. Gerald P. Murphy, Ed. Liss, New York, 1978. xii, 288 pp., illus. $36. *To order this book circle No. 575 on Readers' Service Card*

International Mathematical Olympiads 1959–1977. Compiled and with solutions by Samuel L. Greitzer. Mathematical Association of America, Washington, D.C., 1978. xii, 204 pp., illus. Paper, $6.50; to members, $5. New Mathematical Library, 27.

International Review of Cytology, Vol. 53. G. H. Bourne, J. F. Danielli, and K. W. Jeon, Eds. Academic Press, New York, 1978. viii, 414 pp., illus. $38.

International Review of Research in Mental Retardation. Vol. 9. Norman R. Ellis, Ed. Academic Press, New York, 1978. xvi, 302 pp. $23.

Interspecific Hybridization in Plant Breeding. Proceedings of a congress, Madrid, May 1977. E. Sánchez-Mone and F. Garcia-Olmedo, Eds. EUCARPIA, Madrid, 1978 (available from Escuela Técnica Superior de Ingenieros Agrónomos, Ciudad Universitaria, Madrid). 408 pp., illus. Paper, $16.

Introduction to Colloid Science. W. J. Popiel. Exposition Press, Hicksville, N.Y., 1978. xii, 218 pp., illus. $12.50.

An Introduction to Radioimmunoassay and Related Techniques. T. Chard. North-Holland, Amsterdam, 1978 (U.S. distributor, Elsevier, New York). iv + pp. 293–534, illus. Paper, $22.75. Laboratory Techniques in Biochemistry and Molecular Biology, Vol. 6, part 2.

Introductory Dynamic Oceanography. Stephen Pond and George L. Pickard. Pergamon, New York, 1978. xviii, 242 pp., illus. Paper, $15. *To order this book circle No. 560 on Readers' Service Card*

The Inventions of Leonardo da Vinci. Charles Gibbs-Smith and Gareth Rees. Scribner, New York, 1978. 110 pp., illus. Paper, $7.95.

Just This Side of Madness. Creativity and the Drive to Create. Carol Ann Morizot. Harold House, Houston, 1978. 166 pp. Paper, $6.95.

Language in Africa. An Introductory Survey. Edgar A. Gregersen. Gordon and Breach, New York, 1977. xviii, 238 pp., illus.

$19.50. Library of Anthropology. *To order this book circle No. 561 on Readers' Service Card*

Life on Earth. Edward O. Wilson and 7 others. Sinauer, Sunderland, Mass., ed. 2, 1978. xviii, 846 pp., illus. $15.95. Study Guide. vi, 282 pp. Paper, $4.95. *To order this book circle No. 569 on Readers' Service Card*

Linguistic Variation. Models and Methods. Papers from a conference, Montreal, Mar. 1977. David Sankoff, Ed. Academic Press, New York, 1978. xx, 296 pp., illus. $17.50.

Living in Prison. The Ecology of Survival. Hans Toch with contributions by John Gibbs, John Seymour, and Daniel Lockwood. Free Press (Macmillan), New York, and Collier Macmillan, London, 1977. xiv, 318 pp. $12.95.

Living with Fear. Understanding and Coping with Anxiety. Isaac M. Marks. McGraw-Hill, New York, 1978. xiv, 304 pp. $10.

Locally Solid Riesz Spaces. Charalambos D. Aliprantis and Owen Burkinshaw. Academic Press, New York, 1978. xii, 198 pp. $19.50. Pure and Applied Mathematics.

The Luck of Nineveh. Archaeology's Great Adventure. Arnold C. Brackman. McGraw-Hill, New York, 1978. viii, 350 pp. $14.95. *To order this book circle No. 562 on Readers' Service Card*

Lying-In. A History of Childbirth in America. Richard W. Wertz and Dorothy C. Wertz. Free Press (Macmillan), London, 1977. xii, 260 pp., illus. $10.

The Management of Federal Research and Development. An Analysis of Major Issues and Processes. John Salasin, Ed. Mitre Corporation, McLean, Va., 1977. viii, 134 pp., illus. Paper, $5.

Managerial Planning. An Optimum and Stochastic Control Approach. Charles S. Tapiero. Gordon and Breach, New York, 1977. Two volumes. xxxiv, 642 pp. $44.50. *To order this book circle No. 570 on Readers' Service Card*

Mathematical Methods in the Physical Sciences. Merle C. Potter. Prentice-Hall, Englewood Cliffs, N.J., 1978. xii, 466 pp., illus. $18.95.

McCance and Widdowson's The Composition of Foods. A. A. Paul and D. A. T. Southdate. Her Majesty's Stationery Office, London, and Elsevier/North-Holland, New York, ed. 4, 1978. xii, 418 pp. $59.25.

Medical Students, Medical Schools and Society during Five Eras. Factors Affecting the Career Choices of Physicians 1958-1976. Daniel H. Funkenstein. Ballinger (Lippincott), Cambridge, Mass., 1978. xx, 226 pp. $16.50.

Membrane Anomalies of Tumor Cells. D. F. H. Wallach, Ed. Karger, Basel, 1978. viii, 382 pp. $81.25. Progress in Experimental Tumor Research, vol. 22.

Methods in Cell Biology. Vol. 17, Chromatin and Chromosomal Protein Research II. Gary Stein, Janet Stein, and Lewis J. Kleinsmith, Eds. Academic Press, New York, 1978. xx, 434 pp., illus. $39.

Modern Medical Mistakes. Edward C. Lambert. Indiana University Press, Bloomington, 1978. 190 pp. $10.95.

Mood Control. Gene Bylinsky. Scribner, New York, 1978. vi, 170 pp. $8.95.

Navigation Primer for Fishermen. F. S. Howell. Fishing News Books, Farnham, Surrey, England, 1977 (U.S. distributor, Unipub, New York). xvi, 182 pp., illus. Paper, $14.50.

Neptune's Gift. A History of Common Salt. Robert P. Multhaurd. Johns Hopkins University Press, Baltimore, 1978. xviii, 326 pp., il-

lus. $22.50. Johns Hopkins Studies in the History of Technology.

Neuronal Plasticity. Carl W. Cotman, Ed. Raven, New York, 1978. xiv, 336 pp., illus. $25.

Neuroses. A Comprehensive and Critical View. Melvin Gray. Van Nostrand Reinhold, New York, 1978. xviii, 342 pp. $15.95. *To order this book circle No. 571 on Readers' Service Card*

Nuclear Division in the Fungi. Papers from a symposium, Tampa, Fla., Sept. 1977. I. Brent Heath, Ed. Academic Press, New York, 1978. xii, 236 pp., illus. $16.

Organization Development in Public Administration. Part 2, Public Sector Applications of Organization Development Technology. Robert T. Golembiewski and William B. Eddy, Eds. Dekker, New York, 1978. x, 326 pp. Paper, $12.75. Public Administration and Public Policy, 5.

The Origins of the Economy. A Comparative Study of Distribution in Primitive and Peasant Economies. Frederic L. Pryor. Academic Press, New York, 1977. xviii, 478 pp. $19.50. Studies in Social Discontinuity.

Outcaste. Jewish Life in Southern Iran. Laurence D. Loeb. Gordon and Breach, New York, 1977. xxvi, 328 pp., illus. $20. Library of Anthropology. *To order this book circle No. 563 on Readers' Service Card*

Perspectives in Urban Entomology. Papers from a symposium, Washington, D.C., 1976. G. W. Frankie and C. S. Koehler, Eds. Academic Press, New York, 1978. xviii, 418 pp., illus. $21.50.

Perspectives in Virology. Vol. 10. Papers from a symposium. Morris Pollard, Ed. Raven, New York, 1978. xxviii, 248 pp., illus. $25.

Physiological Psychology. Marvin Schwartz. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1978. xviii, 552 pp., illus. $14.95.

Phytosociology. Robert P. McIntosh, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1978 (distributor, Academic Press, New York). xvi, 390 pp., illus. $24.50. Benchmark Papers in Ecology, vol. 6.

Plant and Planet. Anthony Huxley. Penguin, New York, 1978. 464 pp. Paper, $3.95.

Plant Cold Hardiness and Freezing Stress. Mechanisms and Crop Inmplications. Proceedings of a seminar, St. Paul, Minn., Nov. 1977. P. H. Li and A. Sakai, Eds. Academic Press, New York, 1978. xiv, 416 pp., illus. $21.50.

Polynuclear Aromatic Hydrocarbons. Papers from a symposium, Columbus, Ohio, Sept. 1977. Peter W. Jones and Ralph I. Freudenthal, Eds. Raven, New York, 1978. xx, 488 pp., illus. $39.50. Carcinogenesis—A Comprehensive Survey, vol. 3.

Potassium and Plant Health. S. Perrenoud. International Potash Institute, Bern-Worblaufen, Switzerland, 1977. 218 pp., illus. Paper, $7.25. IPI Research Topics, No. 3.

The Power and the Fury. Jack Schmertz. Vantage Press, New York, ed. 2, 1977. vi, 276 pp. $7.95.

Precalculus. Mustafa A. Munem and James P. Yizze. Worth, New York, ed. 3, 1978. xii, 494 pp., illus. $14.95. Study Guide. Paper, $4.95.

Prevention of Neural Tube Defects. The Role of Alpha-Fetoprotein. Papers from a symposium, Los Angeles, Jan. 1977. Barbara F. Crandall and Mary A. B. Brazier, Eds. Academic Press, New York, 1978. xviii, 264 pp., illus. $16.50. UCLA Forum in Medical Sciences, No. 20.

Primary Prevention of Psychopathology.

Vol. 2, Environmental Influences. Papers from a conference, June 1976. Donald G. Forgays, Ed. Published for the University of Vermont by the University Press of New England, Hanover, N.H., 1978. xii, 266 pp. $15.

Principles of Magnetic Resonance. C. P. Slichter. Springer-Verlag, New York, ed. 2, 1978. x, 400 pp., illus. $24.90. Springer Series in Solid-State Sciences, vol. 1. *To order this book circle No. 572 on Readers' Service Card*

Progress in Cybernetics and Systems Research. Vol. 4, Cybernetics of Cognition and Learning, Structure and Dynamics of Socioeconomic Systems, Health Care Systems, Engineering Systems Methodology. Papers from a symposium, 1976. Robert Trappl and Gordon Pask, Eds. Hemisphere, Washington, D.C., and Halsted (Wiley), New York, 1978. xii, 548 pp., illus. $40.

Progress in Nucleic Acid Research and Molecular Biology. Vol. 21. Waldo E. Cohn, Ed. Academic Press, New York, 1978. xvi, 218 pp. $21.50.

The Psychobiology of Mind. William R. Uttal. Erlbaum, Hillsdale, N.J., 1978 (distributor, Halsted [Wiley], New York). xxii, 786 pp., illus. $29.95.

Psychopharmacology of Aversively Motivated Behavior. Hymie Anisman and Giorgio Bighami, Eds. Plenum, New York, 1978. xii, 564 pp., illus. $35.

Quantitative Drug Design. A Critical Introduction. Yvonne Connolly Martin. Dekker, New York, 1978. xii, 426 pp., illus. $38.50. Medicinal Research.

Quantum Electrodynamics. Suraj N. Gupta. Gordon and Breach, New York, 1977. xii, 226 pp. $38. *To order this book circle No. 573 on Readers' Service Card*

Quantum Mechanics. Claude Cohen-Tannoudji, Bernard Diu, and Franck Laioë. Translated from the French edition (Paris, 1977) by Susan Reid Hemley, Nicole Ostrowsky, and Dan Ostrowsky. Wiley-Interscience, New York, and Hermann, Paris, 1978. Two volumes. Vol. 1. xvi, 898 pp., illus. $32.50. Vol. 2. xvi + pp. 901–1524, illus. $27.50.

The Quijotoa Valley Project. E. Jane Rosenthal, Douglas R. Brown, Marc Severson, and John B. Cionts with appendices by Richard S. White, Jr., and seven others. National Park Service Western Archeological Center, Tucson, Ariz., 1978. xiv, 314 pp., illus. Paper.

Radioactive Wastes at the Hanford Reservation. A Technical Review. National Academy of Sciences, Washington, D.C., 1978. xvi, 270 pp., illus. Paper, $8.50.

Recent Advances in the Psychology of Language. Proceedings of a conference, Stirling, Scotland, June 1976. Robin N. Campbell and Philip T. Smith, Eds. Plenum, New York, 1978. 2 parts. Part A, Language Development and Mother-Child Interaction. xiv, 486 pp. $19. Part B, Formal and Experimental Approaches. xiv, 432 pp. $19. NATO Conference Series III, vols. 4a and 4b.

Recovery from Brain Damage. Research and Theory. Stanley Finger, Ed. Plenum, New York, 1978. xvi, 424 pp., illus. $25.

Reproduction and Evolution. Proceedings of a symposium, Canberra, Australia, Dec. 1976. J. H. Calaby and C. H. Tyndale-Biscoe, Eds. Australian Academy of Science, Canberra, 1977. viii, 380 pp., illus. Paper, A$20.

The Scientific Basis of the Art of Teaching. N. L. Gage. Teachers College Press (Columbia University), New York, 1978. 122 pp. Paper, $4.95. The Julius and Rosa Sachs Memorial Lectures.

Second Language Acquisition Research. Is-